

Railway Age

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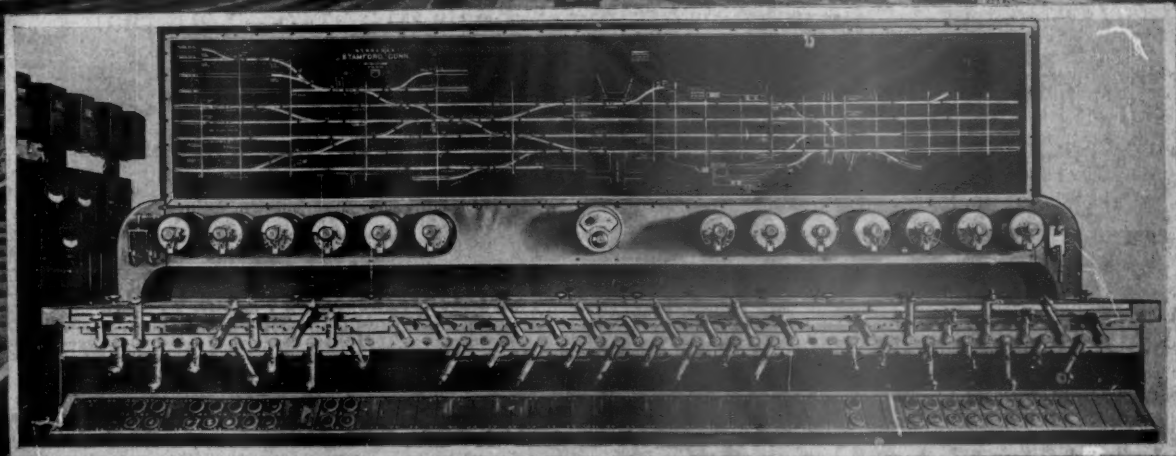
SIXTY-FOURTH YEAR

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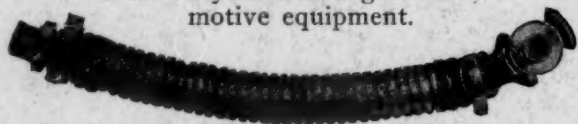
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EDITORIAL

Railway Age

Judge Robert S. Lovett, who has been director of the Division of Capital Expenditures of the McAdoo Railroad

Judge Lovett for Competition

Administration, having resigned that office, is now to resume his duties as president of the Union Pacific. In giving up his duties for the administration, he discussed at some length the railroad situation, and far and away the most significant part of this discussion deals with the subject of competition. Judge Lovett was one of E. H. Harriman's right-hand men, and it will be recalled that the Harriman lines were dissolved under an order of the supreme court because their merger was in contravention of the Sherman law; in other words, because they had tended to stifle competition. His earlier training, therefore, must have acquainted Judge Lovett thoroughly with all that there was to be said in favor of the elimination of competition. He has now had a year of experience in railroad operation where competition has been completely eliminated; nevertheless, he is emphatic in expressing the opinion that much of the progress made in the science of railroading, much of the excellence of service which the public has received from the railroads, is due directly to competition. He is emphatic in the expression of the belief that competition should continue in the future, and he brushes aside as trivial the economies which are to be gained by the elimination of competition. This estimate of the savings under the Railroad Administration, made by the elimination of competition, bears out what most close students of the past year's railroad history believe. Judge Lovett's opinion, however, is based on knowledge which no outside student of railroad affairs has. It should carry very great weight in any discussion of Mr. McAdoo's proposal for a continuation of government operation for another five years.

On Tuesday, December 31, the Standing Committee of the Association of Railway Executives held a meeting at

Warfield Won't Come In

which S. Davies Warfield, president of the National Association of Owners of Railroad Securities, was present. The Railway Executives' Committee, as has been mentioned previously in these columns, has worked out a tentative plan, laying down the fundamentals which it is believed Congress should consider in developing a solution of the railroad problem. In arriving at a plan upon which all could agree, it was necessary for each of the interests represented on the committee to make sacrifices. It was undoubtedly felt that the plan must be general enough in its terms to serve as a basis for constructive legislation and not as a ready-made structure. While this tentative plan has not been made public, some of its main features have been discussed publicly. Federal incorporation and federal regulation to the exclusion of State regulation, and the placing of responsibility upon some government office for the results of regulation, as well as giving to some body the authority to regulate, are fundamental to this plan. No matter how divergent the views of those who

have intelligently thought about this railroad problem have been as to details, these main principles have been almost universally accepted. It is a little hard to see how any thinking man can refuse to accept these principles, unless he adopt advocacy of government ownership; not so with Mr. Warfield, however. Although Samuel Untermyer, counsel for the Security Owners' Association, has come out as personally favoring government ownership, Mr. Warfield has not, so far as we know, done so; but, after the conference with the railway executives, he makes the statement that "we may say, however, that the fundamentals of our plan, now under consideration, differ materially from those of the plan of the executives' association." Mr. Warfield has been in close touch and cognizant of each step in the working out of the railway executives' plan. It would have seemed feasible to have co-operation, but apparently that is not to be. A fundamentally different plan is to be worked out by Mr. Warfield's association. If it is advocacy of government ownership, well and good; the issue can be squarely met. If it is an attempt to play upon local prejudices by a reiteration of States' rights theories, it will serve but to befog the issue and interject controversies where co-operation and unity are so vitally important.

Careful, discriminating and constructive work has been put into the production of the standard operating statistics forms

Standard Operating Statistics

which are described by Professor W. J. Cunningham in this issue. The forms are more useful and much more logical than those used by a large number of American roads heretofore. They are in all probability more logical than the form of statistics in use on any railroad in the country. Their full value will neither be appreciated nor obtained by the very men who now have the best systems of operating statistics on their own roads. A man who has studied the figures reported monthly on a certain form for his 2,000 or 4,000 or 6,000 miles of road for 20 years will in all probability find it difficult if not entirely useless to try to get the same information as quickly and as accurately from the new standard form of statistics as from his own forms. This is no reflection on the Operating Statistics Section of the United States Railroad Administration. After an executive has followed for years the operations of his property through the variation in certain statistics—learned to see reflected in certain figures the approach of certain conditions even before these conditions are suspected by the operating officers on the ground, has hammered at this thing or that thing through an insistence on a better showing in a principal figure in his statistics, it would be absurd to expect that he could use a new tool as easily and as successfully. It is for the younger generation of railroad men and for railroad officers whose forms of statistics, handed down to them possibly from predecessors, have been clumsy and ill-devised, that the new forms will come as a great immediate benefit. As a side light on the magnitude of the task that the Railroad Administration undertook, it would be interesting to try to picture how large a pile of these

operating statistics would have to be gone through by the director general of 250,000 miles of railroad if he were personally to attempt to supervise or even to keep himself informed of the operation of the railroad system of which he is the head. On the other hand, an executive operating only 3,000 or 4,000 miles could use the statistics shown on Professor Cunningham's forms to great advantage, and without plunging himself helplessly into an unmanageable mass of figures.

Railway Signaling Situation

SIGNAL INSTALLATIONS very generally proved their value in facilitating the enormous traffic in troops and war supplies which had to be moved. Operating officers are coming to realize more and more the value of short block sections—that is, automatic signals—for other purposes than preventing collisions. Every hour saved between terminals in running time means a decided saving in locomotives, cars and overtime. Some roads have practically eliminated the use of the "31" train order through the operation of their trains by signal indication. The advantage of the remote control of outlying switches by low voltage switch movements to prevent the stopping of heavy freight trains is becoming more and more apparent, and the number of installations of this character is increasing each year.

The signal departments have been greatly handicapped during the year by the loss of experienced men. A large number of the employees went into the army, while others quit to go with manufacturers of war supplies because the wages received were much higher than the railroads could hope to pay. As it takes about two years to develop a good maintainer, it is easy to see what the loss of experienced men means to a railroad. While General Order No. 27 and Supplements Nos. 4 and 8 increasing wages helped materially in holding the employees, a feeling of dissatisfaction was created because of the discrepancy existing between the wage scales of the two supplements. This feeling was further increased as Supplement No. 8 was applied on a majority of the roads, giving signal workmen less than men in other departments doing work of a less exacting nature. The application of either supplement meant that the men, in many instances, would receive more than their immediate superiors, and this is the condition which exists at the present time. A number of experienced signal officers have accordingly entered other fields of work or have taken positions in the ranks in order to benefit by the increased wages.

The entire wage situation has been demoralizing. Signal department officers have been placed in a bad light, because they could offer nothing but promises to their men. The morale of the men was badly affected because they saw those in other departments doing work that did not require the training necessary for the signal department getting considerably more money than they were. As a direct result, the men are inclined to view with suspicion the interpretations of the award made by their superior officers.

A development of importance in the signal field during the past year is the large number of employees who have joined a union. Perhaps 70 per cent of the signal repair and construction men in the country are now unionized and many of the large roads are solidly organized. On December 19 an organization of signal supervisory officers was formed at Chicago to act as a unit in connection with all matters affecting them. This has been another direct outgrowth of the wage situation as outlined above. It is not surprising that men in the signal departments have taken these steps since the Railroad Administration has placed a premium upon organization.

Railway Construction in 1918

THERE IS LITTLE about railway construction during 1918 that is comparable with that of previous years. The mileage of new lines built, 721, comprises such a combination of projects carried over from previous years and short mine, oil and lumber spurs undertaken as war measures since the advent of federal management that it bears no definite relation to the 979 miles of new main lines completed during 1917. The acid test of war necessity resulted in the postponement of more than one project, while the high prices and difficulties of securing deliveries of materials, especially rails, under war conditions, were also deterring influences. Therefore the mileage of new line completed cannot be taken as an index of the normal attitude toward new railway ventures.

The second track mileage of 1918 is constituted very nearly the same as the new line mileage. The longer stretches of second track completed comprise projects of a year's standing or longer, while the shorter sections consist of work undertaken this year under the established policy of the Railroad Administration to provide additional main tracks where light construction promised speedy completion and therefore early utilization in the relief of congested traffic.

Of far greater importance this year than either the new line or multiple track construction has been the terminal work, both freight and engine. In engine terminals especially, which proved so woefully inadequate a year ago, the number of complete new projects is particularly evident. Freight yard work in the main has involved the extension of existing terminals, usually following the line of established plans for future extensions, but in many cases involving provision for additional tracks where they could be best applied to relieve congestion. Wye connections and cut-offs affording communication between facilities of normally competing properties were also features of the season's work and these in most cases accomplished much in the relief of traffic while involving but limited expenditures.

Another phase of the additions and betterments program that must not be lost sight of is the renewed interest taken in water treatment—interest that took material form in the construction of a large number of water softening plants. This tendency is also a direct consequence of the engine troubles of a year ago that were brought to a pronounced crisis by the severe season. The important economies to be obtained from these plants, if efficiently operated, will go a long way toward further development in this line.

Taken as a whole, the season's progress on the terminal projects is probably a disappointment to most of those concerned. Possibly the program was too ambitious, or the estimates of material and labor available were more optimistic than they should have been. The necessity for a review of the improvement budget by a centralized body implied a volume of work that could not be completed without the lapse of considerable time. As a consequence, many of the projects were not authorized until late in the season, thus placing a premium on construction methods that would hasten completion as rapidly as possible. Slow delivery of materials also had a marked influence in delaying work. Particularly in yard work, progress was delayed by the lack of a sufficient amount of relayer rail; that is, owing to a delay in the rail renewal programs of the roads, the relayer rail was not available in adequate quantities.

Nearly all work undertaken during the last year was war work in the sense that the improvements undertaken would be of definite advantage in handling war traffic. As a consequence the bulk of the new work was concentrated in the East, particularly east of Pittsburgh. But as this territory is normally one of dense traffic, the possibilities are that nearly all of the improvements will be of definite, permanent value, with the roads restored to private operation.

Railway Expenses Under Government Control

IF THERE WERE not such serious possibilities of disaster in government experimentation with privately owned property under a form of guarantee that recognizes only the physical property, it would be interesting to see Mr. McAdoo given an opportunity to make good on his predication that the economies incident to unification under government control would make possible a material reduction in rates, probably within a year, without any reduction of the high wage scales established this year. Of course, talk of a reduction in rates from the level established this year is very conservative as compared with the claims usually made by government ownership advocates, that the government could reduce rates and raise wages at the same time; but even so, if Mr. McAdoo has any facts to demonstrate the possibility of an early reduction in rates, it seems strange that they have not been made public.

While much has been made of the saving of \$4,000,000 in officers' salaries by charging them to the corporate accounts instead of to operating expenses, and of the \$23,000,000 reduction in traffic expenses, and while scattering figures have been given out of savings made here and there by rerouting of traffic, joint use of facilities, etc., they are insignificant as compared with the total increase in expenses and do not bulk very large as compared with the margin of uncertainty as to the amount of the wage increase. Wages have been increased so fast that no one apparently knows yet within \$100,000,000 to \$200,000,000 how much the increase in payroll will aggregate for the year. We know that in the nine months ending with September 30 the railroads had handled 2.1 per cent more tons of revenue freight one mile and 14.3 per cent more passengers one mile than they did in the corresponding period of 1917, at an increased operating expense of \$779,000,000; and while we know that the larger part of that amount represents wage increases, and some of it represents the increased cost of fuel and other supplies, we do not know how much of it represents the wage increase and therefore do not know whether government operation has been economical or extravagant aside from the question of wages.

We realize that the rate advance was in effect for only about half of the year, while much of the wage increase applied throughout the year, and we know that the increase in revenues on a yearly basis probably exceeds the amount of the wage increase for a full year; but we also know that some very large expenses will have to be incurred in the near future that were not incurred in 1918 because it was not possible during the war to keep up the proper amount of maintenance work. While maintenance expenses have been greater this year than last year, that fact is largely due to the higher wages and material costs and at least as far as maintenance of way and structures is concerned a considerably larger amount will have to be expended in the coming year to make up for work deferred during the period of government control.

While it was hardly to be expected that the economies incident to unification would show their full results in the first year, it is also probable that many economies made in the name of war necessity will not be possible hereafter. Coal operators are already exerting pressure to bring about the discontinuance of the coal zone system, shippers and state commissioners are already agitating for a relaxation of the pressure for heavy car loading, and if the Railroad Administration continues its present efforts to show that the government can give a better passenger service than was possible during the war it may find that the effect of the war was not entirely on the side of increased expenses.

It is rather futile to attempt to disagree with so courageous

an optimist as Mr. McAdoo, particularly in the face of the uncertainties of the coming year, but we do not hesitate to register an opinion that the forthcoming annual report of the Railroad Administration will be able to deduce a more favorable outlook from the 10 months' figures of 1918 earnings and expenses, which should be available by that time, than it will be possible to extract from the complete figures for the year.

Central Control of Purchases

ALBA B. JOHNSON, president of the Baldwin Locomotive Works and of the Railway Business Association, in referring to the standard locomotives, said that "The workman who is responsible for the best workmanship should be entitled to the selection of his own tools." With cars and locomotives designed and purchased by central committees for all the railroads in the country the opposite is true, for here we have, in effect, a small body of men indiscriminately handing out to the vast army of railway workers cars and locomotives, and giving little consideration to whether or not they meet the local conditions. This standard equipment, with its appurtenances, is determined upon by a committee made up of representatives from different sections of the country. The experience of most of them is different from that of the others. Their operating conditions are different; they have preconceived ideas of how cars and locomotives should be designed and what should be used on them based on the experience they have had in their respective territories. In an endeavor to come to an agreement many compromises are made. This is particularly true of the appliances that go on the equipment. No one common standard can be agreed upon, with the result that four or five are listed as having given good service. One committeeman swears by one device, a second by another, and so on, and in an endeavor to come to an agreement a group selection is made.

This done, the committee on design is through with its work and the matter passes on to a central purchasing committee, which with the accepted list before it attempts to make the necessary purchases. Its business is to buy the equipment at the lowest possible price. The committee members are business men not as familiar with the merits of the design or the material they purchase as those who are to use it. They seek the lowest price and buy from the man who makes the most attractive offer. Not being sufficiently familiar with the service value of the apparatus under consideration they do not know when it is economy to pay more for a certain device than for another. The first cost of any article is by no means an indication of its relative value. The service it renders and the cost of maintenance should be very carefully considered. Some railway supply concerns get greater returns from the sale of repair parts than from the sale of the original device itself. They can afford to lower the price because of the profit in repair parts, and further, it would not be impossible to raise the price on these repair parts in order to make up for what was lost in the lower price of the original article. With purchases made in this way—what happens? The equipment is built and sent to the railroads regardless of whether the roads to which it is sent should happen to have any of the particular standard equipment appliances on their own equipment. This complicates not only the operation of the new equipment, but its maintenance. The men that handle it are not familiar with the particular appliances provided and the men repairing it must provide themselves with a new line of repair parts. The seller is far removed from the user. In doing business with a committee at Washington for all the railroads on a large scale there is not that personal touch that is common when the appliances are sold directly to the

railroads themselves. There is not that incentive to the equipment manufacturer to provide service with his products. Where the railroads buy individually and anything goes wrong with the article purchased, the local representative of the supply company is notified and gets on the job immediately. He has a particular interest in the service his device gives on that road, for he—not alone his company—is after a repeat order. Under centralized purchases the road communicates with Washington and after the usual red tape accompanying the administration of large bodies, the equipment manufacturer is notified and a representative having no direct personal interest in the matter is sent out to rectify the trouble.

Satisfactory results cannot be obtained by making purchases in this way. The service a device gives is far more important than its first cost when its ultimate value is considered. Centralized purchases, furthermore, tend to restrict development. When the number of appliances performing the same functions is limited for the sake of standardization, the manufacturers do not have the same incentive to improve their products or to introduce new designs, on account of the difficulty in getting them into service in sufficiently large numbers thoroughly to determine their service value. On the other hand, devices will sometimes be accepted and a relatively large number placed in service before the design has reached a satisfactory stage of development. The latter has been found particularly true in the case of at least one appliance that is being used on the standard locomotives.

Service and economy demand that "the workman who is responsible for the best workmanship should be entitled to the selection of his own tools." This cannot be attained through a central organization. It cannot be attained when the purchaser buys on a price basis alone. Those who are to use what is to be purchased should have the opportunity and should be capable of determining the kind and make of the article to be bought, and those that do the purchasing should only seek to get the best price obtainable.

Maintenance of Way Progress in 1918

MAINTENANCE OF WAY WORK was subjected to very little constructive supervision by the Railroad Administration during the working season of 1918. There was some interference in the handling of labor, largely with respect to wages and methods of employing men, while with materials and supplies the activities of the government other than in the administration of priorities were limited almost entirely to standardizing the specifications and methods of purchasing ties. The work suffered early in the season from the lack of a clearly defined policy. Maintenance officers hesitated to go ahead with the work because they were not sure of their authority to proceed. They finally came to understand that they were to conduct the work along the usual lines, but no general policy was enunciated at any time during the year.

Responsibility for the failure to assume direct charge of maintenance of way work while other departments of the railroads were being subjected to such detailed supervision may be charged primarily to the delay in organizing a maintenance department under either the central or the regional authorities until late in August, when C. A. Morse, chief engineer of the Chicago, Rock Island & Pacific, was made assistant director of operation in charge of maintenance of way and structures. Maintenance of way or engineering assistants to the regional directors were appointed about the same time. Since their appointment these men, working individually and also collectively as a committee, have endeavored to expedite maintenance of way activities, but their efforts came too late in the season to exert a material influence on the condition of the roads at the close of the year. Most of their

time has also been directed to the construction rather than the maintenance activities of the Railroad Administration.

With the opening of the season in 1918 maintenance officers were confronted with the necessity of maintaining tracks and structures that had been suffering for several years from a lack of sufficient labor and material, while carrying an ever-increasing traffic. Rail renewals had been estimated by various authorities as being in arrears in amounts up to 10,000,000 tons. Tie renewals had also been inadequate, while many roads were struggling along with only skeleton forces. Work on the cantonments had also drawn large numbers of bridge carpenters from the service.

The labor situation is discussed at length in another article in this number, and attention is directed to the delay in obtaining action in the matter of wages, meantime tying the hands of the officers of the individual roads in the exercise of their own initiative in obtaining men. These measures may have been necessary to prevent a disastrous competition for labor, but in the absence of prompt centralized action it tended to hamper the organization of adequate forces during the early part of the season when the most effective work could be done. This deficiency in forces was estimated in July at from 30 to 50 per cent.

With regard to rails, the roads were even more unfortunate. Previous to the initiation of government operation the roads had contracted for about 2,000,000 tons of rails for delivery during 1913, but in allocating the supply of steel available for all national needs the War Industries Board found it impossible to allot manufacturing capacities to the production of rails in excess of about 25,000 tons per week, and it was not until November that this rate of production was appreciably increased. As a result deliveries of rails during the year aggregated only about 1,200,000 tons, or less than half of the normal consumption of rails in this country. As long as the production of rails was limited by the lack of manufacturing capacity there was no occasion for the Railroad Administration to place any additional orders, and since these difficulties have been removed the government has failed to take any further action.

With respect to ties, the efforts of the Railroad Administration, while probably holding down prices and preventing confusion and inequitable distribution, have resulted in decreasing the production materially. It is probable that more ties would have been made in this country during the past year if there had been no interference. Deliveries of other track and structural materials were restricted by the same influences that limited the production of rails, and the consequent shortage of materials culminated toward the end of the year in a centralized movement for conservation of all materials used in maintenance of way work. This was a matter of national necessity and secured the enthusiastic co-operation of railway officers and men, but after about two months of this campaign the end of the war removed the principal necessity for it on other considerations than economy. While this campaign undoubtedly saved much steel and iron, and gave the men a better appreciation of the value of the materials they used, there is no question but that the tracks and structures would have been in a better condition if these measures of economy had not been necessary.

It is a commonly accepted fact that the roads are in a depreciated state of maintenance at the present time, and that the condition is far inferior to what it was when the government took control. Just how much so cannot be expressed readily in figures, although it is now very important that this should be done, for when the government took over the roads it agreed to return them to their owners in as good physical condition as when taken, or to compensate them for the difference. The determination of this difference is now one of the most perplexing problems imposed upon the maintenance officers of the Railroad Administration and the corporate organizations of the railroads.

Administration Purchasing Policy Inconsistent with Labor Policy

DIRECTOR GENERAL McADOO has been quite insistent that wages of railroad employees should not be decreased, but should be maintained permanently at the present high level. Business men generally, throughout the country, seem to be largely of the same opinion, except that, instead of stating that the present schedule should be maintained permanently, they suggest that it should not be reduced in any greater proportion than the cost of living. One branch of the Railroad Administration, however, is apparently not very greatly in sympathy with the director general's views, at least its actions do not indicate that it is. Word seems to have gone forth from the purchasing department, for instance, that purchases all along the line should be curtailed or discontinued until lower prices prevail.

As labor is a large factor in determining the prices for most of the materials that the railroads use, it would appear that the purchasing departments are doing their best to upset market conditions and indirectly force wages down, in accordance with the law of supply and demand. This action is exceedingly unfortunate. Railroad managers in times past have been severely criticised because when traffic and earnings fell off they curtailed their expenditures at the very time that they should have been improving their facilities, and getting the equipment into condition for renewed activity as soon as more prosperous conditions prevailed. Manifestly, the improvements could be made more cheaply under such conditions, because of the more plentiful supply of labor and material and the fact that the work would not interfere to any great extent with the comparatively light traffic. The railroad manager had the excuse that his finances would not permit him to make the expenditures. It would seem, however, that under present conditions, when the administration is urging every possible effort to be made looking toward the re-employment of "war workers" and returning soldiers, that Congress would be glad to add sufficiently to the Railroad Administration's revolving fund to make it possible to provide the additional facilities and equipment that will be greatly needed under heavy traffic conditions that are sure to come not many months hence.

Those men who are following the industrial situation most closely expect that for a period of from possibly three to six months there will be a necessary slowing up because of changing over to normal conditions. They predict, however, that thereafter business conditions will improve rapidly and that the country may expect a long-continued period of heavy business activity. Under these circumstances it is advisable, and even quite necessary, that those industries that can place extensive orders for equipment, either for repairs or improvements, should do so at this time, in order to tide over the temporary business depression. It is useless to look forward to lower prices, except possibly because of unsettled conditions for very brief periods, and it is exceedingly desirable that the government should guard against any flurries of this sort. It would seem that if the situation is handled properly the railroad corporations might be prevailed upon to cooperate in the buying movement even though they have not been shown much consideration since the establishment of federal control. Even if it is not possible for them to cooperate because of financial or other conditions, it must be remembered that there is a large amount of deferred maintenance to be taken up and also that there are many improvements that can be made that will pay for themselves within a very limited period, and which will justify considerable expenditures at this time even though there may be a considerable falling off of prices after the reconstruction period, which, however, will probably extend over a number of years.

A large amount of the present locomotive and car equip-

ment cannot be operated economically, and it will be good business to scrap it just as quickly as possible. It is true that, particularly in relation to locomotives, the older equipment has been placed in good repair; nevertheless it does not have sufficient capacity to handle the heavy train loads that are necessary in the interests of economical operation. A keen observer recently made the remark that a locomotive which was built 15 years ago was a liability because it could not haul heavy enough trains. On the other hand, many locomotives which are 10 years old could be rebuilt or fitted with capacity-increasing devices. The expense would be offset by the savings within a comparatively brief period, in some cases in as short a time as one year. Those roads that were carrying out extensive programs for rebuilding and strengthening car equipment in pre-war days profited richly by it under the conditions of heavy traffic that have existed during the past few years.

If high wages are to be maintained it will be necessary to reduce the cost of operation and to furnish the roads with the kind of equipment that can be used to the best advantage toward this end. If the Railroad Administration is really in earnest about maintaining the present wage scale, and we believe it is, then it should lend its help in making it practicable. The new director general has an opportunity to do a big constructive piece of work in this direction.

A Year of Government Operation

A MOMENTOUS CHANGE in mental attitude among railroad men and the public has marked the 1918 year of railroad operation under the direction of the government Railroad Administration. This change of mental attitude is far more important as having an effect on the future than are the physical changes which have taken place, important as they are when viewed in detail. The fact that more miles of road have been torn up than have been built, the fact that in a period of greatest need of every additional railroad facility not over half of the freight car building capacity of the country has been used, and that, whereas the government's order for 100,000 freight cars is but little more than half of what the private corporations were wont to order each year in normal times, and that only about a tenth of the government's order has been delivered, the lasting importance of these things is small when compared to the change in point of view of the public and the two million men actually engaged in railroad operation.

The general public over the entire country for the first time in the history of the United States realizes that there is a railroad problem. For years the more intelligent and thoughtful people of the country contemptuously and with some warmth branded the cry of railroad difficulties as a cry of wolf. The less thoughtful mass of citizens did not bother their heads one way or the other about the railroads.

Analogous to this attitude was that of the greater number of railroad employees and a goodly part of the railroad officers. Dissatisfaction with railroad management both on the part of the public and of employees and officers was rife, but it was largely a dissatisfaction with details. Annoyances and petty injustices bulked large in the horizon of those who thought about railroads at all, and even with those whose businesses compelled them to come in daily or periodical but less frequent contact with railroad operation, it was the personal equation which defined and circumscribed the opinions held on railroad questions. Now everyone knows that there is a railroad problem, and notwithstanding the continued potency of the purely personal point of view of this problem, it is receiving a consideration based on an attempt, at least, to understand something more of it than an occasional personal contact with it would impart;

it is this that distinguishes the present situation from any other in the history of the country.

Personal grievances against the railroads, while they were operated by private owners, fell into well-defined ruts. The shipper who wanted a transportation service below cost, the traveler who demanded a service comparable to that on the finest excess fare trains whenever and wherever he traveled, the railroad officer who was everlastingly being handicapped and beaten down in his requests for authority to make expenditures, and the employee who compared his wages and conditions of employment with conditions in other lines of work, all experienced a general shaking up during the past year that brought the railroad problem more nearly into its proper perspective. The shipper experienced a service and rates that he had not dreamed possible in these free and politically governed United States, the traveler experienced annoyances—"dis-service," as Director General McAdoo so aptly terms it—and high rates that temporarily took the breath of complaint out of him; the railroad officer found that what he had considered a shortsighted restriction was in reality an incentive to better work; and the railroad employee alone was satisfied with a satisfaction which resulted only too often in his quitting his job. Self-analysis not being one of the besetting sins of the country, what has taken place, so far from having shaken the faith of the citizens in any of the above categories, has led to a more self-assertive discussion of the railroad problem than ever indulged in heretofore, and in this discussion lies potentiality of great good. The significance of the statistics reflecting railroad operation in the past year lies largely in the fact that they have attained conscious significance for the first time in the minds of the great majority of people in the country.

In Europe, the four years of war have left a complicated physical problem of railroad rehabilitation. In this country, while there is suspended animation in railroad extension and railroad betterment and actual deferment of necessary repairs and upkeep of facilities, there has been no widespread and serious deterioration of the physical property of railroads. There is a widespread and serious impairment of the working ability and team play of railroad men. Allowed to go on, this might well prove to be destructive. Convincing discovery that something is wrong is the first step toward the discovery of a remedy for this wrong.

Take, for instance, the problems that the Railroad Administration has tackled as set forth in the account published elsewhere of the work of the administration. Many of these things are unimportant in themselves, many others have been handled illogically or not entirely in a disinterested manner, but look at the advertising they have had. It has been worth more than all of the traffic department's expenditures on advertising put together.

The Railroad Administration engaged the services of some of the most able of railroad officers. It was free to draw upon, and did draw upon, the services of railroad executives whose best thought and genius was hardly purchasable for a money wage. With this as a groundwork, with the credit of the government behind it, with an overthrowing of the precedent of railroad officers in the handling of the wage problem and with power to increase rates to almost any extent, the United States Railroad Administration demonstrated that there was a railroad problem. The year, 1918, has outlined in broad, crude strokes of unmistakable vigor the difficulties which have beset the railroads and the public in its relation with the railroads in the past.

If, however, there was too little public interest taken in the railroad situation in the past, there has been a very intimate interest taken in railroad management by various groups of bankers. Not infrequently, this interest amounted virtually to banking control of railroad management. There

was keen competition until a few years ago between the three or four larger banking houses, which were known as houses of original issue, for the financing of the large railroad systems which sold issues of from ten to fifty million dollars of securities at one time. There was competition among the smaller banking houses to participate in the syndicates headed by the houses of original issue, and there was competition between the smaller houses to underwrite smaller issues of notes, equipment trust certificates, and other securities in amounts ranging from a million to five million dollars.

The bankers were represented on the boards of directors and the voice which they had in the selection of the management was often compelling. As long as railroad securities could find a ready market among individual investors and institutions, such as savings banks and life insurance companies, it was to the interest of the bankers to have the companies sell securities up to a limit of safety. During all this time the bankers appreciated the dangers of the course that government regulation was taking and stood with the railroad men in an attempt to change this course. When, however, it became evident that the united efforts of railroad men and bankers would prove of no avail, and when, furthermore, the market for railroad securities narrowed almost to the vanishing point, the bankers' point of view radically changed. It was argued that the logic and the justice of the situation demanded that the government, having through regulation forced the railroads into an impossible situation, should now assume responsibility; and the taking over of the roads by the President quite possibly met with the approval of many of the bankers and met with no serious opposition from any of them.

The attitude now of many bankers is that they are willing to consider railroad financing if the railroads have good security to offer, but that good banking forbids them to loan money to railroad companies, with the exception of a few of the stronger ones, under present conditions. There is a tendency to get out from under the railroad problem entirely. Private credit, the bankers say, financed the building of 260,000 miles of American railroad, but unwise, silly, demagogic regulation on the part of the federal government, and more especially of the states, has irreparably damaged this credit structure, and now probably the best thing to do is to have the government use the public credit to support the railroad securities now outstanding and to finance future needs. So runs the argument.

Private industry bids fair to offer a field for profitable banking for years to come in this country. Transportation facilities were necessarily a first consideration. With transportation facilities provided, private credit can be used profitably to establish innumerable new industries.

The bankers who heretofore profited, and at the same time performed a useful public service, from the transferring from the railroad companies to investors, savings banks and insurance companies the stocks and bonds issued by the road and conveying to the railroad company the proceeds of the sale less a commission, stand ready to step out and let the institutions holding the outstanding securities protect their own interests and the railroad managements do their future financing in any way they can find available.

The situation is not without elements of hopefulness. With public interest thoroughly aroused in the railroad situation, with some of the more objectionable features of banking domination of railroad managements in a fair way to be eliminated, with the more statesmanlike of the bankers working in a constructive way on the railroad problem, with the development of means for the distribution of securities among the small investors rather than among the savings banks and insurance companies, and with the hope of elimination of pernicious state regulation, the prospects for a satisfactory solution of the railroad problem are good.

American Railway Forces in the Great War

Remarkable Story of Transportation Department of
A. E. F. Made Public for First Time

By Samuel O. Dunn
Editor of the *Railway Age*

THERE is nothing more romantic and striking in the entire history of war than the story of the raising and organization of the American army in the Great War, of the sending of 2,000,000 members of it to Europe and of its participation in a struggle carried on more than 3,500 miles from the nearest part of its own country. One of the most extraordinary chapters in this story must be devoted to the work done by the transportation department of the American army.

Expeditionary Forces in France

A great deal of the attention of government officials and the public has justifiably and necessarily been devoted to the problem of providing shipping with which to move our troops and supplies for them from the United States to Europe. It has been tacitly assumed by many that, with the landing of the troops and supplies in France, the problem of military transportation would be solved. It has not been generally understood that the American forces have been situated mainly in eastern France, and that therefore when troops and supplies have reached Europe there has still remained the necessity of transporting them across France to the front for distances of 500 to 1,000 miles. Since the armistice was signed large parts of our troops have been moved from the general district in which they were stationed before up to the Rhine. Therefore, while the cessation of hostilities has reduced in some ways the demands upon our Transportation Corps, it has increased greatly the average distance that supplies must be moved, and therefore the distances over which our railway men must operate and our trains must be moved.

When the United States entered the war in April, 1917, the officers and employees of American railways knew extremely little—in fact, practically all of them knew next to nothing—about the way in which the railways of Europe were constructed, equipped and operated. Even as late as July, 1917, the transportation department was practically non-existent. One year later—in June, 1918—it had a personnel of 1,300 officers and 30,000 men, was operating through eleven French ports, and over an extensive system of railways and inland waterways. It was running exclusively American trains, the first train which was exclusively American in equipment and personnel having been run on July 1, 1918, from Gievre to Nevers, a distance of 83 miles.

When the armistice was signed, in November, 1918, the American Transportation Corps had a personnel of 1,970

officers and 53,136 enlisted men. In addition, 553 officers and 21,452 men were attached to it for duty, making a total assigned and attached personnel of 2,523 officers and 74,588 men. Of this number, 576 officers and 21,832 men were on duty in the zone of the advance, and 1,947 officers and 52,756 men in the Service of Supply. Of those on duty in the Service of Supply, 779 officers and 22,079 men were at work at the ports; 328 officers and 546 men in the headquarters' organization (at Tours), and the rest were concerned with train operation, car and locomotive erection, maintenance of way, and inland waterway transport.

On November 30 there were 37 American railway officers and 2,687 men engaged in operating trains for the French, while 126 officers and 2,530 men were engaged in maintenance of way work for the French. The total number of men engaged in operating American trains was 16,000, while 6,139 were working in American railway shops, and 3,927 were engaged in the maintenance of American trackage. These figures relate only to railway work which was being done in the rear of the advanced zone. The Transportation Corps was operating over 5,000 miles of line; was transferring traffic from ships to cars and barges at 30 ports, and was handling about 32,000 tons of freight and about 10,000 soldiers daily. American railway men, directed by American railway officers, were running through trains made up entirely of American locomotives and cars, and hauling exclusively American freight over three lines of communication from French ports to the American front for distances of 500 to 1,000 miles.

In considering the significance of the service rendered by our transportation forces in France, it must never be forgotten that our supplies and troops were moved over railways which already were being used to render two other kinds of service. First, the French railways over which operations were conducted had to continue to be used for moving their commercial freight and passenger business. Second, they had to continue to transport the military passenger and freight business of the French Government. The American transportation organization and traffic had to be superimposed upon and co-ordinated with those previously existing, and the French roads were regarded as badly congested before our forces arrived. This point must be emphasized before an adequate understanding of what has been done can be obtained.

It will be long before a full and adequate account will or can be given of all the things that have been achieved by our transportation forces in France, and the way that these things have been done. The almost impenetrable veil interposed until recently by the censorship between the army supply and transportation service and the American public has now been lifted. All the data are at present available to those who have time and opportunity to get them and capacity to assimilate them. The present difficulty about telling the story is that it is so big and is replete with such a vast number of important details, that nobody who has not been in touch throughout with all the developments can learn the entire story except by giving literally months to the task of mastering it. So, too, those who have been in touch throughout with the developments are restrained from



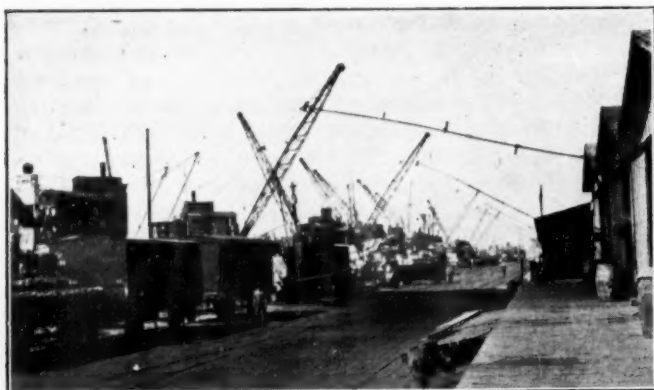
Samuel O. Dunn

telling them either by official considerations, or by the fact that they are too busy.

The writer has had opportunity to visit Tours, the headquarters of the American Service of Supplies, which includes the Transportation Corps. He is the first American press representative to visit the headquarters of the Transportation Corps since the signing of the armistice. He is, therefore, the first who has been officially given full access to all the sources of information as to what has been done, how it has been done, and the difficulties that have had to be overcome in doing it. The article which follows will, in consequence, give the first authorized and connected account of the work of the Transportation Corps. Necessarily, however, it will be incomplete. When the entire history is written it will fill a volume; and a most instructive and valuable volume it will be to those interested in the important subject of military railway transportation in its numerous phases.

What Actually Has Been Done

Many things have been published about what the American railway men have done in France. Insofar as these have been correct they have been very fragmentary. In many cases they have been more astonishing than true. One yarn which has gained widespread currency and cre-



Landing Freight at French Bassens, Bordeaux

dence is that our railway men have built, equipped and operated a new four-track railway clear across France. It can hardly be necessary to tell railway men that this report is without foundation. What our railway men have done is to take over the operation, and maintain and enlarge the facilities of existing French railways to the extent necessary, first, to move our own armies and supplies to the front, and, second, to enable the French army to continue to carry on its part of the struggle with unimpaired energy and effectiveness.

In some cases this has involved merely loaning the French railways American railway troops to operate the trains and maintain the rolling stock and tracks of French railways. In other cases it has involved the operation of American trains over the same lines as French trains, and the maintenance of the tracks and equipment by American railway soldiers. In other cases, it has meant the exclusive construction, maintenance and operation of yards, terminals and even entire parts of lines by our soldier railway men.

The principal ports of debarkation for American supplies have been those in the region of St. Nazaire and those in the region of Bordeaux, on the western coast of France. These groups of ports are served almost solely by the Paris-Orleans, one of the five large privately managed railways of France. The Americans were moving so large a part of the business passing over this road, and were so largely operating and maintaining it when the armistice was signed,

that negotiations were pending for turning its management entirely over to our Transportation Corps. Of course, these negotiations have now been terminated.

While, however, more use was made of the Paris-Orleans than any other road, our railway men were also using portions of the lines of the Etat (a government-owned railway which embraces the old Western and State railways), the

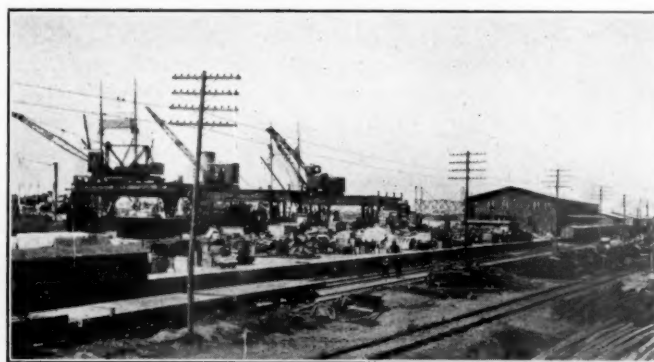


Steam Shovel and Train on Embankment Between Canal and River Loire; Nevers Cut-Off

Paris, Lyons & Mediterranean, the Est (Eastern) and the Midi (Southern). These are all the large railways in France except the Nord (Northern). A large part of the Nord was practically destroyed during the war, it being in the principal zone of hostilities, and 45 per cent of it having at one time been in the possession of the Germans. Furthermore, the available parts of it have been used by the British in handling their troops and supplies. It should be added that a portion of our troops and supplies have been handled by the French railroads with their own equipment and personnel. This was especially true during the early part of our participation in the war.

Some of the New Facilities Provided

In order to make it possible to transfer from the ships to the railways all the vast quantities of supplies shipped from America to France for our army, it was necessary greatly to enlarge the transfer facilities at many of the important French ports. In order to enable the French railways to handle this vast additional traffic, it was necessary greatly to enlarge the facilities of the railways by building second, third and fourth tracks in some places; by building cut-offs in other places; by constructing numerous large yards and



One of the Ten American Berths at Bassens

vast storehouses; by building shops to erect and maintain locomotives and cars, and by importing and putting in service large quantities of railway equipment and materials. Over 300 large construction projects (to be exact, 316) were undertaken for the Transportation Corps. The total number of miles of new trackage actually built was 937, and the number of cars shipped from the United States knocked down and erected in France up to December 12 was 15,068.

The number of locomotives from the United States put in service by our military forces in France was 1,105. Up to December 12 the complete record of the Transportation Corps with respect to the ordering, acquisition and erection of locomotives and cars was as follows:

	Locomotives			Freight cars		
	From U. S.	Other sources	Total	From U. S.	Other sources	Total
No. ordered	1,600	425	2,025	30,000	1,040	31,040
On sea	34	...	34	400	...	400
At port	139	...	139	747	...	747
At shop for erection...	19	63	82	1,238	...	1,238
Erected today (Dec. 12)	8	...	8	80	...	80
Erected to date	1,105	336	1,441	15,068	988	16,056

Amount of Traffic Handled

The magnitude of the work which the Transportation Corps has done is indicated, although only partially indi-



Gantry Cranes at American Bassens, Bordeaux

cated, by the tonnage of supplies and the number of soldiers it has handled. Between June 1, 1917, and November 30, 1918, the total tonnage of supplies moved for the American Expeditionary Forces was 6,547,621 tons. What was accomplished is much better indicated by the increase in the tonnage handled per month and per day. In June, 1917, the tonnage handled was 24,524, or 817 tons per day, while in November, 1918, the tonnage handled was 920,972, or 30,699 tons per day.

The business handled was rapidly increasing when the armistice was signed, and in the first twelve days of December the tonnage unloaded at the ports averaged 31,926 tons daily. And this was less than one-third of what it was expected to handle daily when the American army in Europe had grown to 4,000,000 men. Plans had been made and were being carried out for providing a transportation capacity of 101,000 tons a day by June, 1919, if the war lasted until then.

In the eighteen months from June, 1917, to November, 1918, inclusive, the number of troops transported into France was 1,865,440, and the number of animals, 53,117. The number of troops handled by the Transportation Service in France is not, of course, the same as the number that arrived in Europe, since many American soldiers reached England, for example, who never got to France, but were returned home after the signing of the armistice.

It is hardly necessary to say that such stupendous things were not done by American railway officers and men in a foreign land and under wholly strange conditions without encountering tremendous difficulties which it required great imagination, foresight, patience, energy and administrative ability to overcome. Fortunately, the War Department called to its assistance just when they were needed several of the foremost railway men of the United States. It has been chiefly to their efforts that the wonderful record that has been made is due, and they have received the loyal and able support of the many railway officers and men who vol-

untarily left much more remunerative posts at home to enter a service abroad which required of them the hardest and most unremitting exertion; which separated them from their friends and families for months or years, and which afforded none of the excitement and was surrounded by none of the glamor of combatant military service.

Some Difficulties of the Problem

The problem presented to our transportation department was so difficult, partly because it was necessary to operate over railways whose facilities were not only inadequate but had been developed and operated in entirely different ways from the railways in the United States. Another thing which made it difficult was that there were no officers or men on American railways who had been trained before the war for military railway service, and that there were almost no officers in the regular army of the United States who knew anything about the operation of railways. In consequence, it was difficult for the army men to understand why railway organization and operation could not be made to fit their hard-and-fast military notions, and equally difficult for the railway men to understand many things which the army men demanded and insisted upon for more or less substantial military reasons.

It is an open secret that, owing to these conditions, there was much friction, at times, both between the French and American railway officers, and between the American army men and railway men. The organization of the transportation department, and its relations to other branches of the service, were, in consequence, changed repeatedly, the most important reorganization effected having been made as recently as November 12. In spite of all difficulties, however, the results attained have been far greater than the most optimistic would have believed possible a year and a half ago.

The development of our military transportation service has been carried on partly in the United States and partly in Europe. When it became necessary to send troops to the Mexican border, a transportation service was organized by the War Department, with Samuel M. Felton, president of



General View, Nevers Cut-Off; Looking East Toward Loire Valley

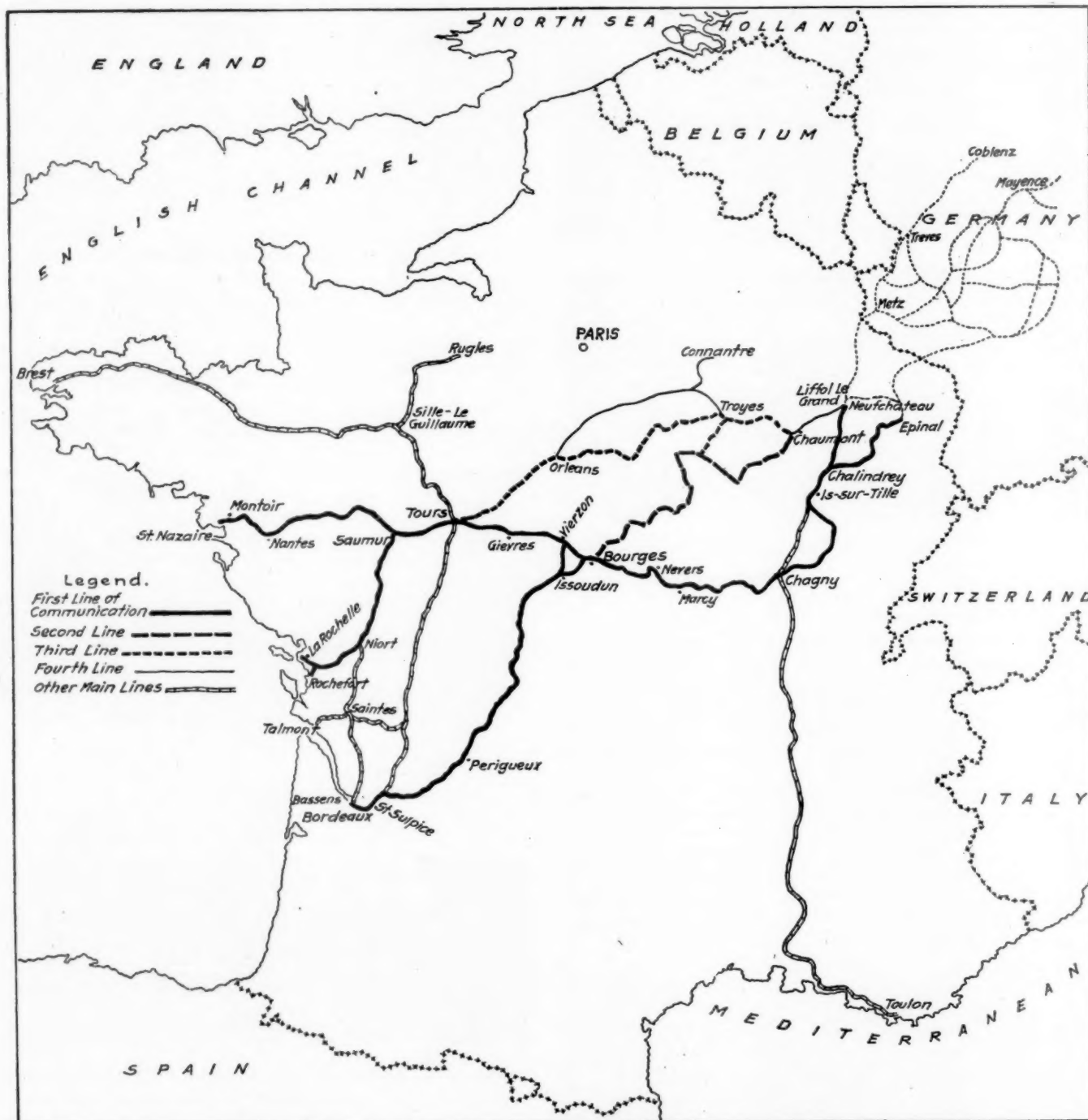
the Chicago Great Western Railway, as its head. On our entrance into the war in Europe this service was expanded, and Mr. Felton was made Director of Military Railways. On Mr. Felton and his staff were imposed the heavy duty and responsibility of providing from the United States the transportation supplies and men needed overseas.

In Europe there was organized, with W. W. Atterbury, vice-president in charge of operation of the Pennsylvania Railroad (now a brigadier general), at its head, a department which was called at one time the "Transportation Service," and more recently the "Transportation Corps." Its work has been to develop and manage the transportation

service in Europe. The present article is concerned almost solely with what has been done overseas. It would, however, be very incomplete if it did not note the fact that those who have been in the overseas service are unanimous in commending the energy and efficiency which Mr. Felton and his organization in the United States have shown in their

portation was to play in America's participation in the struggle when he had said to Secretary of War Baker, in accepting command of the American Expeditionary Forces: "The success of our armies is going to depend on how they are kept and supplied, i. e., upon transportation."

The commission sent to Europe to investigate the trans-



Lines of Communication, American Expeditionary Forces. Light Dotted Lines Show Advance into Germany

efforts to fill all the requisitions which have been made by the transportation department in Europe.

Early Stages of the Work

The first step was taken toward organizing our transportation service overseas, when, in May, 1917, a commission was sent to Europe to investigate the situation from a transportation point of view. General Pershing had expressed his opinion of the importance of the part trans-

portation situation was composed of Col. William Barclay Parsons; Major (now Colonel) W. J. Wilgus, formerly vice-president of the New York Central; Capt. A. B. Barber, of the Corps of Engineers, U. S. Army; W. A. Garrett, formerly president of the Seaboard Air Line, and later vice-president of the Chicago Great Western, and F. de St. Phalle, of the Baldwin Locomotive Works. They were the first American soldiers to arrive in France, and reported to General Pershing in June.

Col. Parsons soon joined his regiment, Capt. Barber was assigned to general staff duty, Mr. Garrett returned to America, and soon Maj. Wilgus was left as the sole nucleus of the transportation service. He associated with him Capt. L. A. Jenny, formerly chief draughtsman of the New York Central, who had come with General Pershing. These two men, sitting on soap boxes, with packing cases as a desk, at 149 Boulevard Haussman, in Paris, drew up what became known as "Requisition No. 6." This set forth the amount and kinds of railway equipment, port equipment, tools and materials which were needed then; and it has been the basis of all requisitions made for the transportation service since that time.

American Men, Equipment and Trains

Major Wilgus outlined the general policy with respect to military transportation which the conditions seemed to warrant. He set forth that the American army must prepare to operate its own trains, made up of its own locomotives and cars, and manned by its own men, from the seaports to the front, over the French railways under trackage rights.

The principle of trackage rights, which is so familiar in America, was entirely unknown in France, and at first the French railway officers did not know what Major Wilgus was talking about. They found it hard to understand how it was possible to operate two systems of transportation over the same tracks at the same time.

Major Wilgus favored the use in France of rolling stock built in America, and designed according to American practice with only such limitations as were imposed by the clearances and the strength of the bridges of the French railways, which generally were not sufficient to accommodate the larger types of American locomotives and freight cars. The type of locomotive favored by Major Wilgus and adopted for general transportation service was a Consolidation of 36,000 lb. tractive effort; while freight cars of 30 tons capacity were adopted. These big locomotives and cars—especially the latter—looked very large on the French railways, the average capacity of whose freight cars is about 15 tons. It was specified that all American locomotives and cars should be equipped with air brakes, which are unknown upon the freight equipment of French railways. The couplers were to be of the French type, in order that American and French cars might be handled in the same trains.

General Pershing took the view that the operation of our military railway service should be placed in charge of a man of large experience in the operation of commercial railways in the United States, and indicated to Secretary Baker his opinion that the ablest American railway man available should be secured. Apparently hearing nothing in response from Secretary Baker, General Pershing appointed Major Wilgus to his staff with the title of Director of Military Railways.

Meantime, Secretary Baker had secured the services of W. W. Atterbury and sent him to France, where he arrived in September, 1917. The situation presented an opportunity for serious embarrassment and friction. These were prevented by Mr. Atterbury and Major Wilgus. Finding the transportation plans well advanced, Mr. Atterbury offered to return to the United States. Since, however, he had been sent by Secretary Baker, it was agreed that he should be made Director General, and Major Wilgus, with the unselfishness and patriotism he has shown throughout, accepted appointment as Deputy Director General. In due course Mr. Atterbury was given the rank of brigadier general and Major Wilgus the rank of colonel.

Fundamental Principles of Supply Service

In the early part of August, 1917, General Pershing established the principle that there must at all times be kept on

hand in France 90 days' supplies of all kinds for our troops. Forty-five days' supply must be available at base ports; 30 days' supply at intermediate storage points, and 15 days' supply at advance storage points, which were to be 50 or 60 miles from the front.

It was originally estimated that, on the average, there would have to be provided and transported 100 pounds of supplies daily for every American soldier in France. This included supplies of all kinds—munitions, clothing, coal, food-stuffs, etc.—and was based on the needs of soldiers of all kinds, combatant and non-combatant, from generals down to stevedores. It was on the basis of this estimate that the original plans of the transportation service were formulated. If, for example, there were 300,000 men in France it would be necessary to handle 15,000 (short) tons of freight daily for them. Experience showed that this estimate was much too large, and later ones were based on an average requirement of 50 lb. per day per man.

The actual consumption, after the army had become large, was about 40 lb. per man per day. The original estimate erred on the right side, however, and the error doubtless contributed toward the development of a supply service for our army which was so complete and adequate in all respects that it became one of the wonders of Europe. In addition to supplies bought in France, the tonnage for our army actually unloaded at the French ports on December 12 was almost 32,000 tons, or about 35 lb. per man.

Practically all supplies for American troops must be brought to Europe by water. Therefore, before any large movement of supplies could begin, it was necessary to select the ports through which it should be carried on. The selection of these ports must be made, not only with regard to their capacity for receiving and unloading deep draught vessels, but also with regard to the uses to which they were being put already and to the freight-carrying capacity of the railways serving them.

The northern French ports, such as those of Calais and Boulogne, and the railways serving them, were not available, principally because they were being used by the British for handling their troops and supplies. The port of Bordeaux presented great possibilities, because of its situation on the deep estuary of the Gironde river, but it had been heretofore used mainly for passenger business and lacked facilities for handling large quantities of freight.

The Mediterranean ports were not regarded as immediately available because ships attempting to enter the Mediterranean from the west were in great danger of submarine attacks near Gibraltar, and the Mediterranean itself was long infested with submarines.

The port most available for our service at first was St. Nazaire. It was possible to begin immediately, with the facilities in existence, handling through this port supplies for an army of 200,000 men. The first American line of communication was, therefore, originally opened from St. Nazaire to the front.

As time went on, and the number of Americans in France and the amount of supplies which had to be furnished them increased by leaps and bounds, it became necessary rapidly to increase the number of ports used and greatly to enlarge the facilities of many of them. Five entire groups of ports finally were used. These were as follows:

Channel Group.—Le Havre, Fecamp, Hornfleur, Rouen, Cherbourg, St. Malo, Granville.

Brest Group.—Brest, Lorient, St. Brieuc.

Loire River Group.—St. Nazaire, Montoir, Donges, Usine Brulee, Nantes, Les Sables d'Alone, La Pallice, Rochefort, La Rochelle, Ponnay-Charente, Marans.

Gironde River Group.—Bordeaux, Pauillac, Blazefort, St. Loubes, American Bassens, French Bassens, St. Sulpice, St. Pardon, Bayonne.

Mediterranean Group.—Marseilles, Toulon, Cette.

The submarine menace to the Mediterranean ports in due course was greatly reduced by the activity of the navies of the allied powers. Great improvements were made by our forces at St. Nazaire, but the most extensive port facilities constructed were those on the Gironde River estuary in the neighborhood of Bordeaux.

Several very important and interesting articles could be devoted solely to the great works constructed under the direction of the Transportation Department for the enlargement of the facilities of the French ports. The principal dock project was at American Bassens, near Bordeaux. The docks at this point consist of 10 berths of 410 ft. each, served by four tracks along the front of the docks. Electric gantry cranes are used for unloading cargoes from ships and placing the supplies on cars. Immediately back of the docks are classification yards and warehouses. There is at present a covered storage capacity of 121,984 sq. ft. and open storage capacity of 262,170 sq. ft. The project is also served by large receiving, classification and departure yards, and engine terminals are connected with the Paris-Bordeaux line of the Paris-Orleans Railway. Of the 38.6 miles of trackage planned 32.9 miles have been constructed, with complete engine facilities.

American Lines of Communication

A "line of communication," in military parlance, is not, of course, a line of railway, but a route which is kept open to the rear of the army over which orders, intelligence and supplies of all kinds may be brought up. The general headquarters of our Expeditionary Forces have been located at Chaumont, in eastern France—a name which was jealously and successfully guarded until the armistice was signed. The headquarters of the "S. O. S."—Service of Supply—which includes the Transportation Corps, are located at Tours, about one-third of the distance from St. Nazaire and Bordeaux to Chaumont.

The first line of communication of our forces, as finally developed, ran from the St. Nazaire, or Loire River group of ports and the Bordeaux, or Gironde River group of ports, over the Paris-Orleans Railway to Bourges, and thence over the Paris, Lyons and Mediterranean Railway via Marcy, Allerey and Is-Sur-Tille to Liffol Le Grand. Under the plans originally adopted this line of communication was to be used exclusively until the tonnage handled exceeded 25,000 tons daily.

Then a second line of communication was to be opened, which was the same as the first to Bourges, from whence it passed through Etai, Larouge and Neufchateau to Liffol Le Grand. When these two lines of communication were handling a total of 40,000 tons daily, a third line was to be opened from Tours via Orleans and Troyes to Neufchateau.

When the first three lines of communication were handling 50,000 tons a day still a fourth line was to be opened from Brest on the western coast via Versailles, Paris, Connate and Bar Le Duc to Liffol Le Grand; from the Bordeaux Group of ports over a line of railways to Tours not used by the first line of communication, and from Toulon on the Mediterranean to a connection with the first line of communication at Tours. With these four lines of communication it would have been possible to have handled 101,000 tons daily, and the plans which were being carried out contemplated the full opening of all these lines by June, 1919.

As a matter of fact, a large majority of the supplies for our forces were being handled over the first and second lines of communication when the armistice was signed, although the two lines of communication which had not been fully developed were being used to a substantial extent.

The development of a line of communication involved a great deal more than the mere provision of port and railway facilities. As already indicated, General Pershing required base (or port) storage for 45 days' supplies, intermediate

storage for 30 days' supplies, and advance (or regulating) storage for 15 days' supplies. This made it necessary to construct vast storage warehouses, and railway yards for taking supplies in and out of them, along the various lines of communication.

The Development of Storage Facilities

Base storage was provided at Montoir, St. Sulpice, St. Luce, Nantes, Donges, St. Pardon, St. Loubes, Miramas, Blaye Furt and Aigrefeuille. Intermediate storage was provided at Gievres, Montierchaume, and Nevers. Advance, or regulating, depots for general supplies, were provided at Is-Sur-Tille, Liffol Le Grand, and Tavaux. Ammunition depots were provided at Donges (near St. Nazaire), Mehun, Issoudin and Les Cors (all near Bourges) and St. Loubes (near Bordeaux).

The following data regarding the plans made for storage depots at certain places, and the extent to which they had been carried out, will give some idea of the magnitude of this part of the undertaking:

Port (or Base) Storage Projects

Montoir (Near St. Nazaire).—Projected to receive general cargo from a proposed pier. Plans called for receiving, classification, departure and storage yards, covered and open storage, locomotive terminal for watering, coaling and making light repairs.

Trackage planned for 230 miles, of which 125 was built when the armistice was signed.

Covered storage planned, 4,215,000 sq. ft., of which 1,786,000 sq. ft. was finished.

Open storage planned, 9,812,000 sq. ft., of which 6,926,000 sq. ft. had been provided with tracks.

All engine terminal facilities finished.

St. Sulpice (In Bordeaux District).—Plans called for 146 miles of track, of which 91 were completed. Plans called for 3,263,000 sq. ft. of covered storage, of which 2,762,000 were completed. Plans called for 6,864,000 sq. ft. of open storage, of which tracks had been laid for 3,140,000 sq. ft.

Intermediate Storage (30 Days)

Gievres.—This place was on the first line of communication, and handled traffic from St. Nazaire, Nantes and La Rochelle; in the later stages of the war it also handled traffic from Brest. Plans called for 264 miles of track, of which 132 were completed; 4,419,000 sq. ft. covered storage, of which 3,553,000 had been completed, and 10,387,000 sq. ft. of open storage, of which tracks had been laid for 6,000,000 sq. ft. Engine terminal facilities had been completed and in operation for some time.

Montierchaume.—The intermediate storage facilities at this point served the same purpose on the railway line from Bordeaux that the storage facilities at Gievres served on the line from St. Nazaire. The plans called for 225 miles of yard trackage, of which 49 miles were finished; 4,079,000 sq. ft. covered storage, of which 1,123,000 sq. ft. were finished, and 9,600,000 sq. ft. of open storage, of which very little was in service, because of the relatively small amount of trackage that had been built.

Advance, or Regulating Storage

Is-Sur-Tille.—Plans were made here in conjunction with the French, and provided for complete engine facilities, and 95 miles of receiving and classification yards, all of which were completed. The plans also called for 1,847,000 sq. ft. covered storage, of which 1,355,000 sq. ft. had been completed, and 5,110,000 sq. ft. open storage, of which 4,186,000 sq. ft. had been provided with yard tracks. Is-Sur-Tille was the regulating station for the first line of communication, and also for traffic coming up from the Mediterranean ports.

Liffol Le Grand.—This place provided advance storage for the second, third and fourth lines of communication, and could serve as a supplemental station for Is-Sur-Tille. The plans called for complete engine terminal facilities, which were 80 per cent complete; 72 miles of track, of which 42 miles had been built; 407,900 sq. ft. open storage, all of which was completed, and 1,144,000 sq. ft. of open storage, of which 584,000 sq. ft. were available.

One cannot contemplate the vast storage facilities provided without having forcibly brought home to him the fact that the nature of all the traffic handled was very different from that of most of the traffic handled on our railways in the United States, and that, therefore, while many of the methods used in handling it might be similar to those used in the United States, many other methods must be used which were different from those with which our railway men at home are familiar.

A fundamental point which must always be borne in mind is that our Transportation Department served only one shipper—viz., the American Expeditionary Forces—and that it handled only one kind of freight for it—viz., freight for military purposes. In consequence, of course, the determination of the order in which the various kinds of commodities should be moved forward, and the points to which they should be moved, was entirely in the hands of the army men; and there was but one thing to do with commodities which the army did not immediately need, and that was to put them in storage.

The Transportation of Supplies

Ships carrying supplies came partly direct from the United States, and partly from England. During the later months of the year all ships from the United States moved in convoys, protected by cruisers and destroyers. The ships in a convoy were always in danger of being scattered by a storm or other cause; and therefore they always had a predetermined point of rendezvous. When they reached the rendezvous point notice of their arrival there was sent by wireless to Brest, together with information as to their contents. Admiral Wilson of the American Navy who was located at Brest then got into touch with the army Service of Supply, and ascertained where the Service of Supply wished the ships to be unloaded—whether at St. Nazaire, Bordeaux or elsewhere.

All convoys were required to come in sight of Brest, and on the arrival of a convoy there it was instructed regarding the port to which it was to go. Communication between the Service of Supply and Admiral Wilson was handled by one code; and between Admiral Wilson and the ships at sea by a different code; and the codes were changed daily. Therefore the enemy had little opportunity of picking up information regarding the movements of ships.

The storage depots in the zone of the advance—in other words, in the neighborhood of actual hostilities—are called “regulating” stations, because their current conditions and needs really determine the entire handling of supplies from day to day and month to month. As already indicated, the advance stations must have on hand 15 days’ supplies of every kind at all times. As fast as their supplies are consumed they make requisition on the intermediate storage points; which, in turn, when they fall below 30 days’ supplies, make requisition on the base storage points.

The disposition of a cargo when it arrives in port is determined entirely by its character, and by the supply situation as disclosed by the requisitions which have been made from the various storage points, all information regarding these matters being centralized at the headquarters of the Service of Supply at Tours. It may be, for example, that a regulating depot is getting very short of foodstuffs of certain kinds, and that a convoy arrives bearing a large quantity of these foodstuffs. The Transportation Corps, in that case, probably will make up solid trainloads of foodstuffs at the port of

debarkation and run them through to the regulating station.

Or, it may be that certain intermediate stations have fallen below their quota of certain kinds of supplies. In that case, the transportation department will move these kinds of supplies directly to them as fast as the ships bring them in. Of course, in the normal course of events, supplies go from the ships into base storage, and thence to intermediate and advance storage; and the transfers are ordinarily made in large shipments; but the normal course of any kind of events often is interrupted.

It is hardly necessary to say that the system which was in use when the armistice was signed was a result of a long series of developments, beginning with the entrance of the United States into the war. It was, in fact, something intermediate between that which was used immediately after the United States entered the war and that which it was planned to have developed and in use in June, 1919, if the war lasted until then. The tonnage actually unloaded at the various ports in November, 1918, was as follows:

Port	Tonnage	Per cent of total
Brest	67,611	7.34
St. Nazaire	193,846	21.05
Nantes	77,637	8.43
Bordeaux	236,563	25.69
Bayonne	13,268	1.44
Havre	43,529	4.73
Rouen	34,179	3.71
Cherbourg	715	.08
Marseilles	99,866	10.84
La Pallice	82,185	8.92
Rocheport	60,085	6.52
La Sable De Sou	11,488	1.25
Total	920,971	100.00

The Classification of Supplies Handled

The tonnage unloaded at the ports in November was divided among the various classes of supplies as follows:

Supplies	Tonnage	Per cent of total
Coal	207,644	22.55
Forage	68,154	7.40
Foods	177,791	19.30
Clothing	9,451	1.03
Oil	23,629	2.51
Other quartermasters' supplies	63,657	6.91
Transportation materials	89,721	9.74
Motor transportation	50,096	5.44
Engineering supplies	75,272	8.17
Ordnance	64,195	6.97
Medical	10,973	1.19
Signal Corps	3,114	.34
Air Service	9,166	1.00
Gas Service	2,883	.31
Troop property	993	.11
Red Cross	3,765	.30
Y. M. C. A.	2,148	.23
Naval	1,780	.19
Steel billets	54,379	5.91
Miscellaneous	3,161	.34
Totals	920,972	100.00

“Ordnance” in the above classification embraces munitions of all kinds; and it is a striking fact that ordnance constituted less than 7 per cent of the supplies transported. Of course, however, a vast work of transportation was carried on in the United States in handling the fuel and raw materials which were used in the manufacture of the ordnance which ultimately formed so small a part of the supplies unloaded and transported in France.

The tonnage handled in November—about 921,000 tons—was about one-third the approximately 3,030,000 tons per month which it was planned to be handling in June, 1919, when it was assumed the United States would have an army of 4,000,000 men in France. The capacity of the Channel ports for handling American supplies was to be increased from 3,000 tons to 8,000 daily; that of the Brest group, from 2,500 tons to 13,000 tons daily; that of the Loire River group (St. Nazaire, etc.), from 15,600 to 36,500 tons daily, with an increase from 31 to 65 berths for ships; that of the Gironde River group (Bordeaux, etc.), from 9,700 to 28,100 tons daily, with an increase from 22 to 34 berths for ships; and that of the Mediterranean group (Toulon, etc.), from

4,200 tons to 15,000 tons daily, with an increase from 18 to 27 in the number of berths for ships. To summarize, the number of berths for American ships was to be increased from 74 to 150, and the tonnage capacity of the ports from 35,000 tons to 101,000 tons.

New Railway Facilities Provided

It would, of course, have been impossible to have handled the enormous amount of traffic for the American armies in the first year of our participation in the war, much less that which it was planned to handle in future, without an enormous increase in the capacity of the French railways. In order to increase the capacity of the part of the lines used and to be used by our transportation service, a large amount of new equipment was provided, and some important construction projects were carried out. Reference already has been made to the equipment provided. The new construction done included multiple track lines, cut-offs, locomotive and car shops, yards, terminals, etc.

The most important construction project carried out was the Nevers cut-off. Nevers is the junction point of the lines of the Paris, Lyons & Mediterranean Railway from Bourges, Chagny, Cosne and Moulins, and the lines through the city were very much congested. The French wished the Americans to relieve the congestion by building a large yard to the northeast of the city. Instead, they decided to build a cut-off which would render it unnecessary for American trains to pass through the congested city at all. The cut-off saves 8.6 track miles of haul for American traffic. It is a double-track railroad 5.5 miles long. Its construction necessitated about 162,000 cu. yd. of excavation, the placing of about 428,000 cu. yd. of embankment, and the construction of 900 lineal ft. of bridging. The work was started on February 20, 1918, and the line was put into service on October 19.

Another important piece of construction work was the addition of two main tracks to those of the already double-track line from Bourges to Pont Vert. A glance at the map will show that the railways from St. Nazaire and Bordeaux, which were used by the Americans as their first line of communication, converge at Pont Vert, and the line from there to Bourges



Rails Ready to Lay; Nevers Yards Looking West

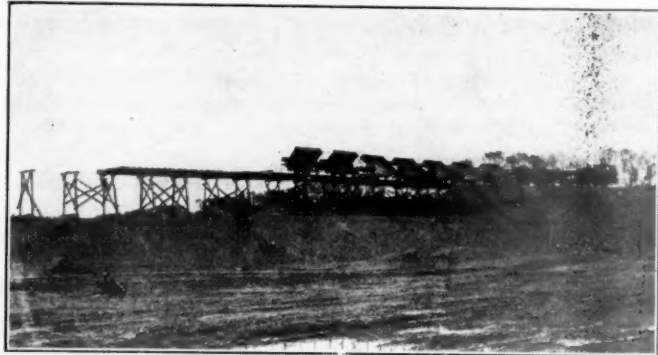
is the neck of the bottle. The additional two tracks built to enlarge this neck and relieve the congestion were 3.7 miles long.

Four main tracks were added to the two already running the five miles from St. Nazaire to Montoir, where as already shown, extensive base storage facilities were provided. Two new tracks—making four in all—were built from Montoir to Donges, which is an important ammunition storage point. From American Bassens (near Bordeaux), to the base storage plant at St. Sulpice, a distance of 6.5 miles, a third track was provided. A three-track line was provided through Nantes, where there had been only one line. Both the Etat (State) and Paris-Orleans Railway enter Nantes, but there had never

been a connection between them. The Americans built a wye connection from the Etat to the storage plant at St. Luce. They also built a wye connection between the lines entering Perigueaux to avoid unnecessary switching.

New engine terminals and yards had also to be provided at various places on the lines over which our trains operated, besides those at the storage points, which already have been mentioned. Saumur was the end of engine runs from Montoir on one line of railway and from La Rochelle and Rochefort on another. Facilities were provided here for handling 65 locomotives, including inspection, coaling, minor repairing, etc. Fifteen miles of yards were projected, of which 13 were finished.

Perigueaux was the end of the engine run from Bordeaux.



Cars Dumping off Trestle, Half-Mile West of Loire River; Nevers Cut-Off

The engine terminal plans here were the same as at Saumur. The plans had been 90 per cent carried out when the armistice was signed, and the terminal was in service.

The engine run eastward from Saumur was to Gievres, and the next run was to Marcy. The engine run eastward from Perigueaux was to Montierchaume. Complete engine facilities were planned for these points, and were practically complete. The American service was using French facilities at points farther along on the lines of communication, but it was planned to provide facilities for handling our locomotives at Etas, San Germain du Puy, Poincoin, Orleans, Troyes and Liffol Le Grand.

Besides providing facilities for taking care of both French and American equipment when it was in service, it was necessary for the American Transportation Department to provide shops for getting it ready to put into service after it was received in France. The erection of locomotives and cars from the United States and the repair of those of France and Belgium by our transportation forces were begun in December, 1917. From that time up to the middle of December, 1918, the shop troops erected 1,055 locomotives from the United States, 99 for the French, and inspected and overhauled 359 from Belgium. They had also repaired 1,423 French locomotives. Records for the same period showed that 14,302 cars from the United States and 975 from other sources were erected, and that 45,993 were repaired for the French.

Locomotive Erection Shop at St. Nazaire

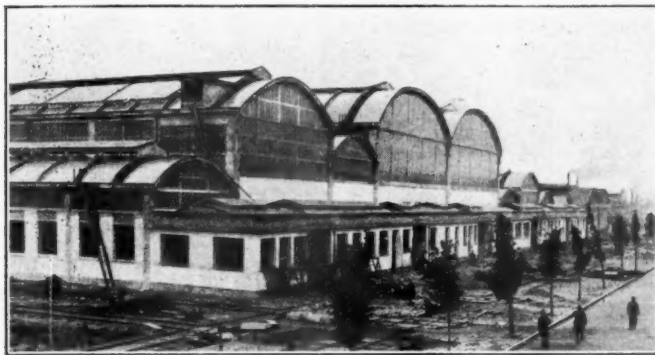
The large locomotive shop, where most of the work on locomotives is done, is at St. Nazaire. Locomotives for overseas shipment are erected and tested in the United States and then knocked down or partially knocked down for shipment. The knocked down locomotives are crated in sixteen boxes, the largest of which weighs 33,000 lb. The partially knocked down locomotives are complete except rods, cab, stack, piping and odd fittings.

Arrangements were made to rent ten locomotive emplacements in Shop No. 1 from the Societe Anonyme des Ateliers et Chantiers de la Loire, nine emplacements in Shop No. 2

from the Societe Anonyme des Chantiers et Ateliers de Saint Nazaire (Penhouet) and the necessary storage and shifting tracks, all the above being located on the Bassin de Penhouet at St. Nazaire.

The main storage tracks located at Shop No. 1 include 14,600 ft. of shifting and storage tracks and embrace 54,500 sq. ft. of locomotive box storage. At Shop No. 2 the yard includes only 2,080 ft. of track with no box storage, this yard being used principally for shifting.

The locomotive boxes are unloaded from the vessels by use of the French Titan cranes, loaded on flat cars and shifted to the locomotive box storage yard, unloaded by a



Locomotive Shops at Nevers

35-ton locomotive crane, and sorted out into complete locomotives, or held until the complete sixteen boxes are available. When sorted properly they are again loaded on flat cars, seven cars to a locomotive, and shifted either to Shop No. 1, close at hand, or Shop No. 2.

The locomotives under erection are handled in the French shops by two 100-ton electric cranes and are erected in proper sequence, that is, the drivers are placed, then the chassis, the boiler, etc., until the locomotive is completed and ready to be sent to Montoir engine facilities to be tested.

The first locomotive was turned out at St. Nazaire shops October 27, 1917. Since that time, up to and including December 12, 1918, 1,032 locomotives have been completed.



Repairing Locomotives at Nevers

This does not include 30 smaller type saddle tank locomotives completed at Rennes. The maximum daily output was obtained on September 6, when 14 locomotives were completed, this number consisting of seven partially erected type and seven knocked down type. The maximum weekly total was obtained during the week September 1 to 7, 1918, and was 69 locomotives. This number included 39 partially erected type and 29 knocked down type, and one saddle tank locomotive. The maximum monthly total was obtained in September, 1918, and was 215 locomotives, 77 partially erected, 137 knocked down, and one saddle tank.

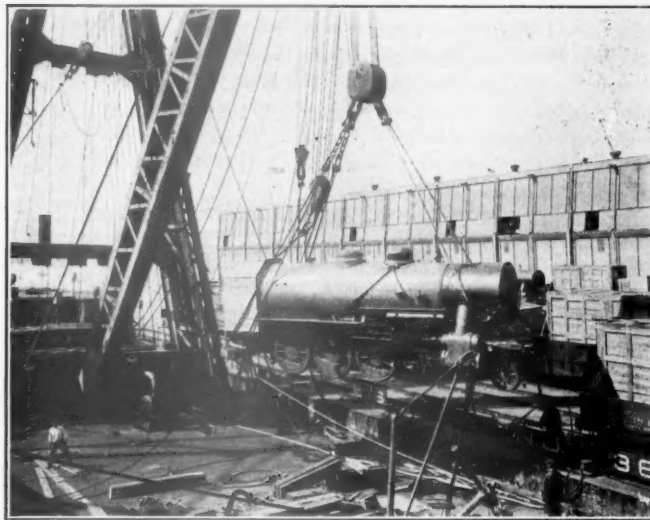
It is estimated that erecting shops No. 1 and No. 2 are capable of an output of 300 locomotives per month, 200

knocked down, and 100 partially erected. This capacity was never realized, due to the fact that the locomotives were not received from the States in sufficient numbers, or were held up in the ports.

When it was first proposed by the Transportation Department that locomotives should be shipped to Europe only partially knocked down, the Shipbuilding Board protested upon the ground that no ships were in existence which could stand up under the strain of such an immense concentrated load. But boats were found which would stand up; and as many as 12 to 15 partially knocked down locomotives, together with their tenders, have been shipped to Europe in a single ship. This method of shipment has saved time and labor on both sides of the Atlantic, but especially after the engines have arrived in Europe. Gantry cranes, which have been erected both at Bordeaux and St. Nazaire, have been used in transferring locomotives from the ships to the docks.

Car Erecting Shops at La Rochelle

The large car erecting shops are at La Rochelle. These shops cover an approximate total area of 1,453,000 sq. ft. The buildings utilize an area of approximately 157,000 sq. ft. There are 34,325 ft., or about 6½ miles, of track, which include two sets of erecting tracks, four sets of un-



Hoisting Locomotive from Lighter to Ship

loading tracks, one locomotive and crane repair track and three tracks for painting.

An erecting set comprises six tracks spaced at 17 ft., 58 ft., 30 ft., 58 ft. and 17 ft. centers. The two outside tracks at each side are crane and unloading tracks. The two middle tracks are the erecting track and crane track. The erecting track is covered for its entire length of approximately 1,300 ft. and is divided into sections, according to the phases of construction, as follows: 200 ft., truck storage and erection; 450 ft., erecting and riveting; 180 ft., flooring; 300 ft. for side and end lining, and 220 ft. for roofing. The painting facilities consist of three tracks, each 1,000 ft. long, which were never covered as originally planned.

The 58 ft. intervals between tracks, at the first approach to the plant proper, are used for storage of car boxes, but further along the various buildings are placed in this space. The buildings included are the power house, offices, shop buildings, waste sheds, store houses, machine and blacksmith shops and quarters.

Car parts are received from the United States crated in 100-car lots. The crates are sorted and stored until the parts for a 100-car lot are on hand. Erection starts with the assembling of trucks, which are then moved along the track to

in the immediate neighborhood; and other sheds were used as required. Certain other ports were used for particular cargoes that were assembled from points that were adjacent to these ports. Cardiff and Barry were used principally for coal, with deck loads of motor trucks, water carts, etc.

From the first part of August until the cessation of hostilities there were approximately 100 vessels employed exclusively in the transport of American supplies and coal from England to France. The vessels sailing from the port of London discharged at Havre and Rouen, and those from the Bristol Channel ports at the Western coast ports of France.

In the case of the freight movement, as soon as the Railway Transport Office ascertained to what port the freight should be forwarded, the embarkation officer at the port was notified to call forward the freight from the manufacturer and issue the necessary permission for the railways to accept the tonnage. The co-operation received from the various British officers controlling the railway movement, as well as the railway officials, has been excellent.

Moving Troops from Britain to France

The main troop movement was through the Port of Liverpool, although a large number of troops were debarked at Glasgow, London and Southampton, also a number at Bristol Channel ports.

Three ports of embarkation were used from England to France, namely, Southampton, Folkestone and Dover. From these ports troops were carried to Cherbourg, Havre and Calais. With the exception of troops for training with the British or to be brigaded with the British, the entire movement was made through Southampton, the larger proportion being moved to Havre. Four American ships were placed in the cross-channel trade from Southampton to Havre to carry American troops. These vessels were pooled with the British ships in order to be used to the greatest possible advantage.

When a troop convoy left America for Great Britain, a cable giving the date of departure, and the number and character of troops on board each ship, was despatched by the War Department through the Navy to Admiral Sims, who delivered this information to the liaison officer at the British War Office, under whose direction the troops were distributed to American rest camps in England. What was known as a "Convoy notice" was issued by the War Office to the various parties interested, giving the distribution of the troops. Train times on the British railways were worked out in accordance with the various railway requirements, and the troops moved through under the direction of the British embarkation and railway officials. After arrival at the various American rest camps, the troops were called forward by the American embarkation officer at Southampton in as large

at Winchester. Later, a portion of the British camp at Southampton was turned over and then a camp at Romsey was constructed for the use of the Americans. Some smaller camps were later built in the immediate vicinity of Winchester and in the fall of 1918 the hutted camp at Codford was taken over. In the spring of 1918 a camp was erected at Knotty Ash, Liverpool, in order to relieve the congestion occurring at that point when a large convoy arrived. This camp was of great assistance in promptly unloading vessels and in reducing the large number of trains which had to be moved immediately on arrival of a convoy.

The capacity of the camps was as follows: Knotty Ash, Liverpool, 10,000; Winchester, 10,000; Standon, 3,000; Remsey, 7,000; Codford, 10,000; and Southampton, 5,000.

Convoys of troops arriving in England varied from 5,000 to 30,000 per day. During the months of June, July, August and September, 1918, an average of approximately 160,000 troops a month were debarked at various ports in England, moved through into the rest camps in England and again called forward and embarked for France. The movement of this large number of troops and accompanying baggage required very careful planning. The average stay of troops in England was only from three to four days. Often 60 to 80 special trains had to be run to handle a convoy of troops.

In addition to the transient troops there were in training in England approximately 20,000 American aviation troops, who required moving from point to point, and to whom supplies had constantly to be moved.

Too much praise cannot be given to the Director of Movements, British War Office, and the various railway and other officials acting under his direction, who actually arranged the details of the movement of American troops and supplies through England. There was never any complaint or suggestion which was brought to their attention that did not receive careful consideration, and in many instances they willingly changed their old-established methods when shown that by other methods a quicker movement or a saving could be made. Brigadier-General O. H. Delano-Osborne, Colonel B. Way, and Captain P. Eardley-Wilmot were largely responsible for the spirit of co-operation which prevailed throughout their entire department.

From the accompanying table giving the details regarding the debarkation of United States troops in Great Britain it will be noted that the total number of officers transported across Great Britain from May 18, 1917, to November 24, 1918, was 45,603; men, 974,297; nurses, 7,274. The increase in the movement after April, 1918, as disclosed by the figures, was extraordinary. Of the total of 1,027,174 officers, men and nurses transported across Great Britain in the 18 months covered, 822,059, or 80 per cent, were handled in the six months, May to October, inclusive.

TRANSPORTATION DEPARTMENT IN GREAT BRITAIN COMPARATIVE STATEMENT TONNAGE, FORWARDED TO FRANCE

	FEBRUARY-NOVEMBER, 1918									
	February	March	April	May	June	July	August	Sept.	October	Nov.
Cement .....	.....	10,351	10,419	17,056	14,536	17,474	14,320	15,660	6,814	1,007
General cargo	480	2,131	16,174	28,822	21,986	16,582	21,609	20,254	24,106	18,445
Potatoes .....	.....	8,555	4,139	1,705	1,688	.....	.....	1,104	10,111	18,091
Lumber .....	.....	1,600	.....	.....	.....	.....	4,300	15,300	3,300	.....
Total: Mis: Sups:.....	480	22,637	30,732	47,583	38,210	34,056	40,429	52,318	44,331	37,543
Coal, coke, etc.	25,173	39,782	53,708	74,087	87,386	116,303	145,659	145,044	215,959	180,343
Grand total	25,653	62,419	84,440	121,670	125,596	150,359	186,088	197,362	260,290	217,886

numbers as the space that could be secured on the cross-channel transports would permit.

At Dover and Folkestone the rest camps were large enough to accommodate the number of troops moving through these ports, so that the troops were moved directly from the port of debarkation to the port of embarkation, and there embarked as fast as they could be accepted in France.

The first rest camp turned over to the American army was

Army Transport Service

It will be seen from the foregoing that the Transportation Corps was not concerned solely with railway operation, but that it also had control of an extensive water service from Great Britain to France. Besides this, it conducted, during the later stages of the war, an important inland waterway service. The Director of the Army Transport Service, who was on the staff of the Director General of Transportation,

supervised the operation and maintenance of all port terminals under American control, the movement of ocean tonnage between the port terminals of the American Expeditionary Forces and England and other European countries; and also the operation of inland waterway transport routes under American control.

Quite an extensive inland waterway service was operated from Le Havre clear across France to the American front. The cargo of ships arriving at Le Havre was partly unloaded into barges there. The ships were then moved down to Rouen, a port with a shallower channel, where the rest of their cargo was unloaded into other barges. The barges were towed down the Seine river by tugs until the canal system was reached, after which they were towed by horses. It takes about six weeks to move freight in this way from Le Havre to Chaumont.

Needless to say, this route has been used chiefly for the transportation of coal and other commodities not requiring rapid movement. The size to which the traffic over this route had grown is indicated by the fact that in November 210 barges, carrying 295,467 tons of freight, were dispatched over it. Of this freight 206,282 tons were loaded at Le Havre, 87,281 at Rouen, and 1,354 tons at Paris.

Problems of Organization

It is much easier now to present a statement of the things that have been done by our transportation forces in France than it is to give an adequate idea of the difficulties that have had to be overcome in accomplishing them. The difficulties encountered have been of many kinds, but probably the most formidable have been those of organization. The transportation department had to operate over foreign railways; it had to be fitted into, and to meet the requirements of the American army; and these two things caused many difficulties and some heart burnings.

Relations with French Railways

The French system of handling railway rolling stock and trains differs sharply from American practice. In America the movement of all trains, passenger and freight, regular and extra, over a division, is subject to the centralized control of a train dispatcher, while control of the distribution of cars is centralized in the superintendent of transportation. In France, on the other hand, the movement of trains and distribution of cars are subject to the highly decentralized control of numerous chefs-de-gare. The French chef-de-gare system has been lucidly described by Lieut.-Col. Frederic A. Delano, Deputy Director General of Transportation, in a special report, which was published in the *Railway Age* for November 8, page 823.

As Col. Delano says, the chef-de-gare "is a good deal more than our station agent, even though the position of station agent or local agent in some of our large stations in America is not infrequently very important. Under French methods of operation, the chef-de-gare not only is in complete charge of all operations within the limits of his station, including distribution of cars and movement of trains, but a through train having arrived at the station may not pass out of it without his authority."

The American transportation department created a central car office to record, trace and control the movements of American cars in accordance with American practice. This office and its method of working were an object of much curiosity and interest to French railway men.

It was not possible similarly to solve the problem of train movement by the introduction of American practice. The American supply trains, and French trains manned by American railway soldiers, had to be run over the same tracks as French trains manned by French railway men.

The American practice of operating trains by means of train dispatching and the block system was incompatible

with the French practice of giving the chef-de-gare absolute authority over all trains within his territory, and of holding trains at one station until word had been telegraphed that trains on the same track had left the next station ahead. Since the chef-de-gare system was in possession, and since the French railway authorities would not set it aside or modify it, it was necessary for the American transportation department to conform to it. In consequence, it was necessary to give all American train service soldiers 30 days' training in French railway operating practice under the direction of French railway employees before they could be allowed to take trains out by themselves.

This was not the worst feature of the undiluted retention of the chef-de-gare system. As Col. Delano pointed out, it has placed a serious limitation upon the transportation capacity of the lines used at a time when increased capacity has been vitally needed. There have been negotiations between the American and French transportation officers looking to the adoption of a better system, but they have come to nothing.

When the war began the French War Department placed an official called the "Commissaire Militaire" in the office of each chef-de-gare to deal with and, indeed, direct him regarding transportation for military purposes. For a similar purpose the American transportation department created an officer unknown to railway practice in the United States—the "Railway Transport Officer." An officer having this title was placed in the office of each chef-de-gare on the principal American lines of communication, his principal task apparently being to prevent the French functionary from interfering unduly with the handling of American trains and freight cars. The term "Railway Transport Officer" was borrowed from the British, who give the title to many men dealing with the railways regarding military matters.

As Col. Delano pointed out, there are many single track lines in the United States which handle more trains with our despatching and block signal system than can be handled on double track lines in France under the chef-de-gare system. The need for increased capacity on the French railways used by our lines of communication was so great that it is probable if the war had continued much longer the American practice of operating trains with the despatching and the block systems would have had to be superimposed in some way upon the chef-de-gare system.

In justice to the chef-de-gare system, however, it must be said that, inefficient as it seems to the American railway mind, the French were operating many of the fastest trains in the world under it before the war, with a record for safety which put the record of American railways to shame.

No Adequate Study of Military Transportation

The most difficult problem with which those concerned with the conducting of transportation for the American forces in France have had to struggle has been that of effecting satisfactory and efficient working relations between the railway transportation service in the rear of the advance zone and other branches of the American Expeditionary Forces. It has been clearly recognized ever since the American Civil War, and especially since the Franco-Prussian War, that railway transportation must play a part of great and growing importance in modern war.

The War Department of the United States has a War College which has been maintained for the study and theoretical solution of the problems that arise in warfare.

Apparently, however, it never occurred to anybody in authority in our army or War Department to give any attention to the subject of modern military transportation. The Great War had been in progress in Europe two and a half years when we entered it; the railways of the contraband countries had been organized and reorganized repeatedly to meet the various and changing military requirements imposed upon

them; but if anybody in the War Department, or the regular army, or even in the army engineer corps, of the United States had carefully observed, reflected upon and drawn definite conclusions from what had been done with respect to transportation during the war in Europe, he has never let anybody know it.

Some years ago Brigadier-General (then Major) Connors, wrote a "Manual of Military Railways." General Connors, as a young man, was an employee of the Chicago and North Western at Clinton, Iowa, before he went to West Point Military Academy. He had always taken a keen and intelligent interest in railway operation. He had studied all that had



Locomotive Repair Shop at Nevers

been done in the operation of military railways up to the time his book was written. But he recognized more clearly than anybody else, perhaps, that his book was completely out of date within a few months after the Great War began; and yet, his book was the only authoritative thing our War Department had on the subject of the organization and operation of military railways.

That serious mistakes were made and friction resulted in dealing with the problem of military transportation after we entered the war is not, therefore, very surprising.

Early Organization Based Upon False Assumptions

When we entered the war our military authorities proceeded upon an assumption derived from the experience of the Civil War and the Franco-Prussian war—viz., that military railways were to be used solely for fighting purposes; that the operation of military railways was constantly an operation of movement, and that as fast as railways which had been used for military purposes were left behind the zone of actual hostilities, they would be turned back to purely civil operation. They, therefore, made the Transportation Department a branch of the Corps of Engineers, and organized the railway troops sent to Europe into engineer regiments, with regular army officers as Colonels.

If the basic assumption that military railways were to be used solely for fighting purposes had been correct this regimental organization might have served very well. General Pershing had not been long in Europe, however, when he became convinced that it was incorrect. As already indicated in July, 1917, he appointed Col. (then Major) Wilgus to his immediate staff as Director of Military Railways. Col. Wilgus and the other members of the original American railway commission to Europe had studied and reported to General Pershing upon the transportation organization and methods used by the British and French, especially the former; and in September, 1917, General Pershing cabled to America that the best experience showed that transportation should be handled by a separate corps officered by men thoroughly versed in the commercial operation of railways. The great

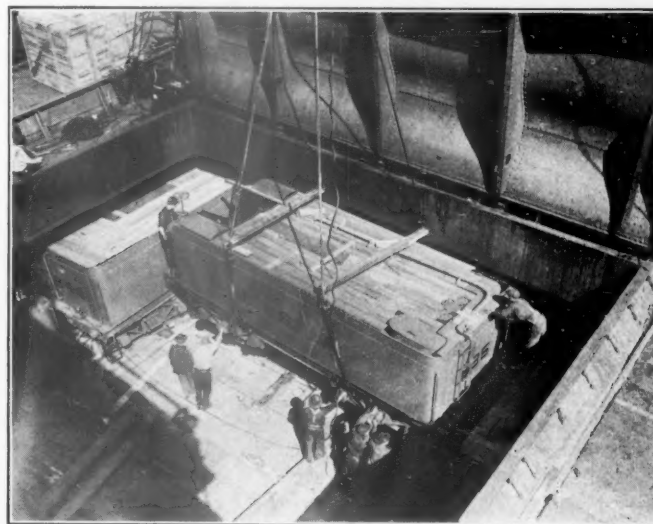
importance, under modern conditions, of military railways in handling supplies in the zone of the rear, as compared with their importance in aiding in carrying on hostilities in the zone of the advance, was being grasped by General Pershing.

When General Atterbury arrived in October he was made, as Col. Wilgus had been, a direct staff officer of General Pershing. The Transportation Department at that time had charge of all railway operation, and of all construction incidental to it; and it was still, theoretically, a part of the Engineer Corps. There were then nine American railway regiments in Europe, of which three had been assigned to the British, and one to the French. The members of these railway regiments were among the first American soldiers to arrive, there being only about 20,000 Americans in Europe, in July.

In the early fall a regular schedule for the movement of troops to Europe was worked out, which called for 1,200,000 men, of whom only 20,000 were to be railway troops. None of these additional railway troops had arrived in December, but they had begun to be sorely needed.

The situation with respect to the condition of freight cars had become very acute on the French railways. No cars from America were then being erected in France; and counting all cars, old and new, including those derived from Great Britain and Spain, the total cars that could be kept in service was declining. The condition of locomotives was remaining about stationary, but was far below the pre-war standard.

The French asked the Americans to furnish them 6,000 men about equally divided between locomotive repair and car repair workers. The 35th Engineer Regiment, which was then being organized for a car repair unit was expedited, and by taking from the cantonments in the United States all the suitable men that could be obtained there were secured about 500 more. Thus, by January, of the 6,000 men for which the French had asked, about 2,000 had been supplied. Mean-



Locomotive Tenders in Hold of Ship

time, none of the railway troops which had been asked for some months before had been received.

Under the defective draft system adopted in the United States no special provision was made for securing special men for the Transportation Department. Railway men were drafted into the ordinary army military units, and once they were in it was very hard to find them and get them out.

First Important Reorganization

Up to February, 1918, the Department of Transportation had under it railways, light railways, roads and inland water transportation, and the Director General of Transportation

was on the staff of the commander-in-chief. Then an important reorganization was effected. The Service of Supply was created, with a commanding general in charge. Within the Service of Supply was created a Service of Utilities, and this was divided into a Department of Construction and Forestry, and a Department of Transportation. All railway construction was taken from the Transportation Department and turned over to the Department of Construction and Forestry, leaving to the Transportation Department only the authority of designing the structures it wanted built.

Army Transport Service Transferred

In April the Army Transport Service, which had always been a branch of the Quartermaster Department, had been transferred to the Transportation Department. This did not lighten the burden of the Transportation Department, in one way since the Army Transport Service had a deplorably insufficient and disorganized force of stevedores at the ports. It was a move in the right direction, however, because it put the entire transportation of supplies, from the time ships reached their rendezvous, under a single organization.

The Transportation Department then had four branches, those of operation, construction (design), army transport service (water) and business management (including accounting, treasury and similar functions).

The entire situation was then extremely unsatisfactory. There were at that time about 15,000 railway men in France, most of them engaged in ordinary railway operation. They were, however, all organized on a regimental basis. Now, a regiment, whether an engineer regiment of 1,500 men, or an infantry regiment of 3,000, will seldom fit into ordinary railway operation anywhere. In consequence, it was necessary to break up the regiments and assign the companies composing them where they were most needed. As railway workers, the men, the "non-coms" and the junior officers were subject to the orders of the railway men in direct charge of their work. As soldiers, on the other hand, they were subject to the control and discipline of their colonels and other military officers, who in many cases were in remote parts of the country. For a time there was not even in General Atterbury's office a personnel officer, who could centralize the handling of the personnel matters of the department from a military point of view. It is hardly necessary to say that, with the Transportation Department cut off from light railways, compelled to go to the Department of Construction and Forestry to get its construction work done, etc., the situation was unsatisfactory from its point of view.

Meantime, the establishment of an independent and permanent Transportation Corps, ranking with the other corps of the regular army, was mooted. In July the so-called "Service of Utilities" died. The "Transportation Department" was changed to the "Transportation Service," reporting direct to the Service of Supply; construction and forestry were made a branch of the Engineer Corps; and a special department of light railways and roads was established at general headquarters at Chaumont. At the same time a schedule for 4,000,000 American soldiers in France was worked out. The Transportation Department reported that this should include 150,000 railway men; but the general staff cut this estimate 20 per cent.

In April there were 270,000 American troops in France; and in June there were 1,300,000. Railway troops had not been arriving in anything approaching sufficient numbers, since it was estimated that 60,000 were needed for every 1,000,000 troops. In July and August alone, however, about 15,000 railway troops were received. This created much confusion. They could not be used immediately since, as already indicated, it takes about 30 days to teach each man enough about French operating rules and methods to put him in service; and it is impracticable to take out of the service enough of the men who were already in service to train them.

By September 15, however, enough men had been trained to enable the Transportation Department to begin operating through trains, yards and terminals from St. Nazaire to the advance zone at Is-Sur-Tille. Previously our railway men had been engaged in running American trains for shorter distances, and in helping the French operate trains, yards and terminals.

Another Important Reorganization

Some time previously Major E. G. Bliss, an able, young regular army man and son of Gen. Tasker H. Bliss, was appointed personnel officer of the Transportation Service, with the title of Director of Military Railway Service. He and Capt. Baker worked out a plan for militarizing the railways in a way that would enable them better to perform their transportation function, and which at the same time would fit them better into the purely military organization. They proposed to create a "Transportation Corps" in the Service of Supply, in place of a mere "Transportation Service." They estimated that an organization to handle all American transportation when the Expeditionary Forces had increased to 4,000,000 should contain 6,669 officers and 187,150 enlisted men. This was to be distributed between 30 railway divisions, 15 grand divisions, and 30 ports. They opposed continuance of the regimental form of organization, and recommended distribution of the railway troops in companies which should be under the discipline and command of their railway superiors as to military as well as railway matters. This recommendation was approved in principle in September.

Soon after another important development occurred. Col. J. A. McCrea, formerly general manager of the Long Island Railroad, had been general manager of the Transportation Service. On October 1 he was made Deputy Director General of Transportation in the zone of the advance; and soon after General Pershing wired General Atterbury that he would expect him to be responsible for the efficient operation of the railways in the American lines of communication to the Rhine. Up to this time the Transportation Service (or Corps) had had jurisdiction only to the advance regulating storage stations at Is-Sur-Tille and Liffol Le Grand. An impenetrable veil had been drawn there, and all transportation in the zone of hostilities had been handled from general headquarters at Chaumont.

The New Transportation Corps

The results of these various changes in organization were summarized in General Order No. 52, issued by Major General Harbord, commanding general of the Service of Supply, on November 12, and in General Order No. 35, issued by Brigadier-General Atterbury, Director General of Transportation on the same date. These orders well merit reading, and even study, as they crystallized the best thought of many of those who had given the most consideration to the subject of what the organization of a system of military railways operating under the conditions of modern war should be.

In General Order No. 52 General Harbord said in part:

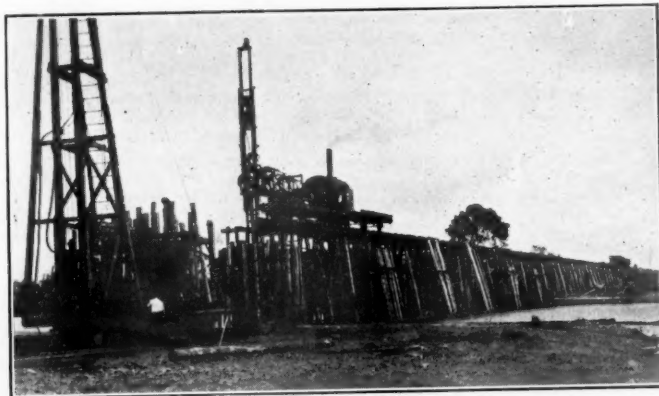
1. Under instructions of Commander-in-Chief, American E. F., the Transportation Corps of the American E. F. will be re-organized by the Director General of Transportation.
2. The railway lines of communication of the American E. F. will be divided into grand divisions under the command of a general superintendent who will be assisted by an adjutant, a supply officer, a personnel adjutant, and such other administrative and technical staff as may be necessary. The general superintendent will act as commanding officer of all railway troops assigned to his grand division. His duties in this connection will be the same as those prescribed in army regulations for a regimental commander.
3. The railway grand divisions will be sub-divided into railway divisions, each division to be commanded by a division superintendent who will be directly responsible to the general superintendent of the railway grand division for the technical and the military efficiency of the troops under his command. The division superintendent will be assigned such technical and administrative staff as may be necessary by the general superintendent.
4. The large railroad shops located at Nevers, La Rochelle and St. Nazaire will be considered, so far as organization is concerned, as equivalent to a railway grand division. In each of these shops the superin-

tendent will be the commanding officer of all transportation corps troops and individuals assigned thereto, and will be assisted by an administrative staff as provided above for a general superintendent of a railway grand division, and such technical staff as may be necessary.

5. Each part will be considered as analogous to a railway grand division so far as organization is concerned. The general superintendent of the port will be the commanding officer of all transportation corps troops and individuals assigned thereto, and will be assisted by an administrative staff as provided above for a general superintendent of a railway grand division, and such technical staff as may be necessary.

6. All transportation corps troops engaged in the Inland Water Transport Service will form a military unit under the command of the Chief of Inland Water Transport Service. The duties of the Chief of Inland Water Transport Service will be the same as those prescribed for a general superintendent of a railway grand division. He will be assisted by an administrative staff as provided above for a general superintendent of a railway grand division, and such technical staff as may be necessary.

7. The transportation corps will consist of transportation corps com-



Pile Driver Over Loire River; Nevers Cut-Off

panies (railway) to be numbered serially, beginning with No. 1; transportation corps companies' stevedore to be numbered serially, beginning with No. 801, and a transportation corps at large. The companies will be assigned to station and duties by the director general of transportation in accordance with the needs of his service.

8. A transportation corps company (railway) will consist of the following:

Captain	1
1st Lieutenants	2
2nd Lieutenants	3
Total commissioned	6
1st Sergeant	1
Sergeants 1st Class	4
Supply Sergeant	1
Mess Sergeant	1
Sergeants	11
Corporals	20
Cooks	5
Mechanics	7
Buglers	2
Privates 1st Class	66
Privates	132
Total enlisted	250

9. A transportation corps company (stevedore) will consist of the following:

Captain	1
1st Lieutenant	1
2nd Lieutenant	1
Total commissioned	3
1st Sergeant	1
Mess Sergeant	1
Supply Sergeant	1
Sergeants	6
Corporals	12
Cooks	5
Mechanics	5
Buglers	2
Privates 1st Class	72
Privates	145
Total enlisted	250

10. A transportation corps at large is authorized to be composed of the following enlisted grades:

M. E. S. G.	400
M. E. J. G.	600
R. S. Maj.	20
B. S. Maj.	40
Sgts. 1st-cl.	840
Sergeants	800
Corporals	800
Cooks	50
Mechanics	100
Privates 1st-cl.	1000
Privates	1000

11. Officers not assigned to organizations will be considered as belonging to the transportation corps at large, and will be assigned to duties under the direction of the director general of transportation.

12. The present regiments and battalions, t. c., will be abolished, and their personnel will be organized into companies.

13. The enlisted men of regimental headquarters and battalion headquarters who cannot be provided for in the reorganization of the companies will be transferred to the transportation corps at large, and will be carried as headquarters detachments at their present stations.

As new regiments, battalions or other organizations arrive in France and are assigned to the transportation corps they will be transferred and reorganized as outlined herein upon request of the director general of transportation.

General Order No. 35, issued by General Atterbury, was in part as follows:

HEADQUARTERS ORGANIZATIONS

The operation and maintenance of all broad gage railroads under American control; the operation and maintenance of ocean terminals and docks and appurtenances thereto; the operation of inland waterway routes and appurtenances thereto and the erection and maintenance of floating equipment, motive power and rolling stock for the American Transportation Service will be under the direction of the director general of transportation. The Director General Transportation will be assisted by the following staff:

- Deputy Directors General Transportation (personal staff). Such number as may be necessary.
- Deputy D. G. T. Railway Department of the Service of Supply.
- Deputy D. G. T. Railway Department of the Zone of Advance.
- Deputy D. G. T. with the French Ministry.
- Deputy D. G. T. with the C. G., Base No. 3.
- Director of Army Transport Service.
- Engineer of Construction.
- Business Manager.
- Director Military Affairs.

Deputy Directors General Transportation (personal staff) will be the personal representatives of the Director General Transportation. The senior deputy at headquarters will act for the Director General Transportation in his absence.

The Deputy Director General Transportation for the Railway Department, S. O. S., will, under the direction of the D. G. T., supervise the operation and maintenance of all broad gage lines under American control between the port terminals and the zone of advance, including equipment and structures, and will perform such other duties as may be delegated by the D. G. T. The headquarters of the deputy director for the railway department, S. O. S., will be as stated in paragraph 2.

The General Manager for the Railway Department, S. O. S., will be responsible, subject to the supervision of the deputy director general transportation, S. O. S., for the performance of such duties connected with the actual operation and maintenance of the lines of railway, equipment and



Steam Shovel (2½ yd.) Loading Dump Cars; Nevers Cut-Off

structures referred to in paragraph 6, as may be assigned to him. He will be assisted by:

- Assistant general managers.
- General superintendent motive power.
- General superintendent transportation.
- General superintendent telegraph and telephone.
- Engineer maintenance of way.
- General superintendents.
- Signal engineer.

The Deputy Director General Transportation, Zone of the Advance, will be charged with duties and have an organization of the S. O. S., and in addition an assistant deputy director general transportation for each American field army, whose duties will be outlined by the deputy director general transportation, zone of advance. His jurisdiction shall comprise such broad gage lines of railway as may be turned over to the transportation corps, American E. F., for operation and maintenance in the zone of the advance. The headquarters of the deputy director general transportation for the zone of the advance will be general headquarters, American E. F.

The Deputy Director General Transportation with the Ministre des Travaux Publics et des Transports will be stationed at Paris. He will represent the D. G. T., in the transaction of business between the transportation corps and the French ministry.

The Deputy Director General Transportation with the D. G. T., Base No. 3, will be stationed at London. He will perform such duties as representative of the D. G. T. as may be assigned to him.

The *Director Army Transport Service* will under the direction of the D. G. T. supervise the operation of all port terminals under American control, including the handling of ships and all floating plant and the transfer and delivery of supplies to the railway transportation service or to storage; the operation of inland water transport routes under American control; the movement of ocean tonnage between the port terminals of the American E. F. and England and other European countries; the distribution of shipping to the various ports of the A. E. F.; the maintenance of all port and inland waterway terminal facilities under American control, including floating equipment and such rolling stock and motive power as may be peculiar to a port terminal operation. He will be assisted by the following staff:

- (a) Deputy director. A. T. S.
- (b) Executive officer.
- (c) General inspector.
- (d) Chief of European service division.
- (e) Chief of inland water transport service.
- (f) Chief troop and cargo division.
- (g) Chief terminal facilities division.
- (h) Chief marine engineer.
- (i) Chief operation division.
- (j) Chief lighterage and harbor craft division.
- (k) General superintendents and superintendents at port.

The *Engineer of Construction* will be responsible for survey, design and inspection to insure construction according to specification of all new lines of railway (broad gage), terminals, docks, shops, buildings and other structures, connected with the transportation service of the American E. F.

The *Business Manager* will be responsible for the procurement of supplies for the transportation corps, American E. F.; for the keeping of accounts; for the compilation of all statistics affecting transportation, and for the duties pertinent thereto and incidental therewith.

The *Director of Military Affairs* will be responsible for the military organization of the transportation corps, American E. F., as a whole; for the procurement and assignment of personnel, and for the keeping of such records as may be required by military authority. He shall establish and maintain liaison on military questions with the general staff and with other staff departments, and is charged with the co-ordination of the various departments of the transportation corps on military matters.

TERRITORIAL BOUNDARIES

Geographical:

The line of demarcation between the railway department for the S. O. S., and the railway department for the zone of advance, will be established by agreement between the deputy directors general transportation for the respective zones, and may be changed from time to time to meet the needs of the service, subject to the approval of the director general transportation.

The line of demarcation between the port terminals and the contiguous railway grand divisions will be established by the director army transport service and the deputy director general transportation, S. O. S., and may be changed from time to time to meet the needs of the service, subject to the approval of the director general transportation. Nothing in this provision shall be construed as nullifying existing arrangements established pursuant to General Orders 31, Headquarters Transportation Service.

Railway Lines:

The railway lines in the zone of the S. O. S. will be divided into grand divisions as follows:

St. Nazaire and La Rochelle to Gievres.
Gievres to Is-sur-Tille.
Bordeaux to Vierzon and Bourges.
Brest to Tours.
Toulon and Marseilles to Chagny.
Tours to Sens and Cosne to Chatillon.

No designation of grand divisions will be made at this time for the zone of the advance, except that all lines radiating from Is-sur-Tille, north and east will be considered as one grand division.

Port Terminals:

The following designation of port terminals is hereby made.

Le Havre and Rouen.
Brest (group).
St. Nazaire.
Nantes (group).
La Pallice and Rochefort.
Bordeaux (group).
Marseilles (group).
London, England (group).

The organization of the transportation corps will be effected as prescribed in General Orders 52, Headquarters, S. O. S., by the commanding officers of the existing transportation corps regiments or the commanding officers stevedore troops, as the case may be, subject to the general supervision of the general superintendent of the railway grand division, port terminal, chief inland water transport service, or the superintendent of the shop, as the case may be, in which the troops are located. The companies thus organized will be reported to the general superintendents, and superintendents of shop and chief inland water transport service. Rosters will immediately be prepared of the individual companies and forwarded to these headquarters. The company will constitute the unit for administration and record.

The general superintendent of a railway grand division, port terminal, chief inland water transport service or superintendent of a shop, will upon the completion of the reorganization, become the actual commanding officer of all transportation corps troops stationed within the territorial limits of his jurisdiction. His staff will consist of an adjutant, to be chosen from the officers under his command and of no higher rank than major; a supply officer, of rank of captain, and a personnel adjutant, of rank of captain.

General superintendents of railway grand divisions, port terminals, and chief of inland water transport service and superintendents of shops may delegate at their discretion such administrative and technical duties as they see fit to subordinate officers. This delegation of authority cannot relieve

the general superintendent or chief of inland water transport service or superintendent of shop of his responsibility as commanding officer of all transportation corps troops under his jurisdiction.

Commissioned officers will not be assigned to railway grand divisions, port terminals, inland water transport service or shops according to a fixed table of organization; as far as possible each railway grand division will be provided with the necessary number of officers to carry on the technical and military functions of the particular railway grand division. This same rule will apply in the assignment of officers to port terminals, shops and inland water transport service. As far as possible, these officers will be assigned to companies in accordance with tables of organization prescribed in G. O. 52, Hdqrs., S. O. S.

To create an "esprit de corps" and to simplify the designation of the transportation corps territorial commands, each railway grand division, port terminal, shop and inland water transport operation, will be given a designation "Grand Division, Transportation Corps." These numbers will be referred to only in the internal administration of the transportation corps. In all matters involving organization, equipment, administration and record, each transportation corps company will be considered as a separate unit of the army. In the same manner all individuals of the transportation corps at large will be considered as headquarters detachments of the particular territorial command in which they may be stationed.

DESIGNATION OF GRAND DIVISIONS

The present railway grand divisions, port terminals, shops and inland water transport operations will become:

Ports—

St. Nazaire 1st grand division, T. C.
Bordeaux (group) 2nd grand division, T. C.
London, England (group) 3rd grand division, T. C.
Le Havre and Rouen 4th grand division, T. C.
Brest (group) 5th grand division, T. C.
Marseilles (group) 6th grand division, T. C.
La Pallice and Rochefort 7th grand division, T. C.
Nantes (group) 11th grand division, T. C.

Inland Water Transport Service—

Seine river operation 12th grand division, T. C.

Railways—

Zone of advance 13th grand division, T. C.
St. Nazaire and La Rochelle to Gievres 14th grand division, T. C.
Gievres to Is-sur-Tille 15th grand division, T. C.
Brest to Tours 16th grand division, T. C.
Bordeaux to Vierzon and Bourges 17th grand division, T. C.
Toulon and Marseilles to Chagny 18th grand division, T. C.
Tours to Sens and Cosne to Chatillon 20th grand division, T. C.

Shops—

Nevers 19th grand division, T. C.
La Rochelle 21st grand division, T. C.
St. Nazaire 22nd grand division, T. C.

Additional grand divisions, T. C., will be established as required upon recommendation to and with the approval of the director general transportation.

General superintendents of the above mentioned grand divisions will so far as railways are concerned, immediately assign units to railway divisions.

TITLES

The following titles will be adopted for the Railway Grand Division Organization:

General superintendent.	Superintendent telegraph and telephone.
Adjutant.	Engineer maintenance of way.
Personnel adjutant.	Accounting officer.
Supply officer.	General road foreman of engines.
Assistant general superintendent.	Troop movement officer.
Chief R. T. O.	Statistical officer.
Superintendent motive power.	

The following titles will be adopted for the Railway Division Organization:

Division superintendent.	Engine house foreman.
Adjutant.	Car repair foreman.
R. T. officer.	Foreman miscellaneous repairs.
Chief train dispatcher.	Storekeeper.
Division operator.	Locomotive and air brake inspector.
Terminal superintendent.	Car inspector.
Engineer maintenance of way.	Trainmaster.
Signal supervisor.	Terminal trainmaster.
Track supervisor.	General yardmaster.
Master carpenter.	Yardmaster.
Master mechanic.	Road foreman of engines.

The following titles will be adopted for the Port Terminal Organization:

General superintendent.	Superintendent troop and cargo division.
Assistant general superintendent.	Disposition officer.
Adjutant.	Chief stevedore.
Personnel adjutant.	Dock superintendent.
Supply officer.	Dock officer.
Executive officer.	Stevedore officer.
Finance officer.	Warehouse superintendent.
Statistical officer.	Warehouse officer.
Property officer.	Terminal trainmaster.
Gear keeper.	Yardmaster.
Supervisor of operation.	Superintendent port terminal facilities.
Marine intelligence officer.	Engineer inspection and maintenance.
Boarding officer.	Mechanical engineer.
Marine superintendent (lighterage and harbor craft).	Electrical engineer.
Port steward.	
Marine engineer.	

The following titles will be adopted for the Port Terminal Organization when such is subsidiary to a larger port:

Superintendent.	Disposition officer.
Adjutant.	Chief stevedore.
Executive officer.	Dock superintendent.
Finance officer.	Dock officer.
Statistical officer.	Stevedore officer.
Property officer.	Warehouse superintendent.
Gear keeper.	Warehouse officer.
Supervisor of operations.	Terminal trainmaster.
Marine intelligence officer.	Yardmaster.
Boarding officer.	Superintendent port terminal facilities.
Marine superintendent (lighterage and harbor craft).	Engineer inspection and maintenance.
Port steward.	Mechanical engineer.
Marine engineer.	Electrical engineer.
Superintendent troop and cargo division.	

GENERAL PROVISIONS

Nothing in this order will be interpreted as superseding provisions of former general orders of the transportation service on the question of responsibility of all commanding officers of transportation corps troops for the state of discipline, sanitation and military and professional efficiency, of the troops under their command; nor shall anything in this order be construed as superseding the existing authority and responsibility of section or other military commanders, as provided by law, army regulations, orders and bulletins.

In the event that a grand division, T. C., as provided for in Paragraph 24 of this order, is commanded by an officer who is not senior in rank, he will issue the necessary orders by direction of the general manager, or director of army transport service, as the case may be.

Under this organization the principal officers were as follows. Where more than two names are given in brackets for one office, the men named have successively held that office:

Director General of Transportation.....	Brig. Gen. W. W. Atterbury.
Deputy Director General of Transportation.....	Col. W. J. Wilgus.
	Col. M. C. Kennedy.
	Lt. Col. F. A. Delano.
	Col. J. A. McCrae.
	Col. G. T. Slade.
	Col. H. C. Nutt.
Assistant Deputy Director General.....	Col. R. E. Wood.
Director of Army Transport Service.....	Lt. Col. H. B. Moore.
	Brig. Gen. Frank P. McCoy.
Engineer of Construction.....	Col. H. C. Booz.
	Col. H. M. Waite.
Business Manager	Lt. Col. A. W. Hudson.
	Col. C. M. Bunting.
	Lt. Col. I. A. Miller.
General Manager of S. O. S.....	Col. F. Mears.
General Manager of Zone of the Advance.....	Col. H. H. Adams.
Assistant General Manager S. O. S.....	Col. F. G. Robbins.
General Superintendents	Lt. Col. E. Stenger.
	Lt. Col. Hinkle.
	Major Alex. Woodruff.
	Major Taylor.
	Lt. Col. B. L. Bugg.
	Major E. H. Shaughnessy.
Signal Engineer	Major Vandersluis.
Port Terminal Superintendents.....	Capt. R. C. Stone.
	Major John A. McDonald.
	Lt. Col. C. A. Stern.
	Lt. Col. F. W. Green.
	Lt. Col. G. T. Newbury.
	Lt. Col. J. H. Elliott.
	Major T. R. Ryan.
	Major W. D. Wells.
Inland Water Transport Director.....	Lt. Col. L. E. Lyon.
Shop Superintendents.....	Lt. Col. G. S. Gaskill.
	Lt. Col. George H. Vincett.
	Major McDonnell.
General Manager's Staff in the S. O. S:	
General Superintendent Motive Power.....	Col. H. H. Maxfield.
General Superintendent Transportation.....	Col. D. C. King.
Engineer Maintenance of Way.....	Major Dilman.
Superintendent Telegraph and Telephone.....	Major E. R. McFarland.

Army Transport Service Staff

Director General Army Transport Service.....	Lt. Col. E. B. Cushing.
Executive Officer	Major O. D. Miller.
Superintendent Troops and Cargo.....	Lt. Col. Coates.
Chief of Operations Division.....	Lt. Col. Coates.
Chief Inspector	Major D. W. McCormick.
Chief Marine Engineer	Major George C. Cook.
Chief of Terminal Ports Division.....	Lt. Col. R. W. Stovel.
Chief of Lighterage and Harbor Craft Div.....	Lt. Com. H. W. Barstow.
Chief Personnel Officer Trans. Corps.....	Major C. A. Lohr.
	Major E. G. Bliss.
	Major E. G. Bliss.

Col. Wilgus is really senior deputy director general. Col. Kennedy, as already indicated, was located in London. The duties of Col. Slade (formerly vice-president of the Northern Pacific) correspond to those of a vice-president in charge of operation. Col. McCrae is deputy director general in the zone of advance. Lt. Col. Delano (formerly president of the Wabash and later of the Monon), who was the latest arrival among the higher officers, is located in Paris, and handles relations with the higher officers of the French railways. Col. Nutt (formerly general manager of the Salt Lake Route) is assistant to Col. McCrae in the zone of the advance.

It will be noted that this organization restricted the Transportation Corps to standard gage railways, ports and inland waterways. Light railways and motor transport were left in other branches of the service. It even continued the rule of confining the construction department of the Transportation Corps to the designing of the structures it needed, their ac-

tual construction being left in the hands of the construction and forestry branch of the Engineer Corps. Under this arrangement the construction plans of the Transportation Corps had first to be submitted to the Construction and Forestry branch, and if it approved them, to the French railway authorities.

Those approved by the French were then returned to the Construction and Forestry Department. This department did all construction work for the Expeditionary Forces on a priority schedule, and railway and port projects had to take their turn with it. It was thought desirable by the general staff to have all construction work for the army concentrated in a single department largely because labor for construction purposes was inadequate and it was believed that it would be most satisfactorily distributed among the different classes of projects if all construction work was in charge of a single department.

One of the interesting and important facts regarding the numerous railway storage and other structures which have been constructed by our forces in France is that they have been built without any agreements or contracts with the French as to their disposition after the war. It is assumed that the French will desire to acquire many of them, but on what basis they shall be paid for has never been determined. It may be said that the French should pay what they have cost. They are likely to take the position that many of the structures are not suited to their need in time of peace. Furthermore, it is going to be very difficult to determine what has been the actual cost of the work which has been done. It has been done by soldiers for soldiers' pay. In some cases the soldiers have been workmen experienced in the kind of work done; in most cases, by soldiers who were not experienced workmen, and many of whom did not relish the tasks they were required to perform. On what basis should the cost of such labor be computed? Again, the materials used were bought in America at high prices, and taken to Europe in ships owned or chartered by the United States Government. On what basis should the cost of these materials be computed?

The problem of determining on what basis the French should pay for the structures built by our soldiers, and for our locomotives and cars, if they decide to take them, is an extremely complicated and difficult one. Meantime, the French are engaged in preparing a bill for the use of their land, railways, and so on, by our forces; and whatever may be their true opinions, their railway representatives are endeavoring to make it clear that they do not even like our railway rolling stock. In the end, a large bill will be presented by each side to the other, and it will require long negotiations to reach a settlement.

Considering all the conditions, the American Transportation Corps has done a remarkable work in Europe, and it would have been possible to appreciate much better the energy and genius that were being devoted to its work if the war had gone on some months longer, and the large plans that had been made for conducting its work had been more fully carried out.

The writer is under obligations to several of the officers of the Transportation Corps for having put information at his disposal, and especially to General Atterbury, Col. Wilgus, Col. M. C. Kennedy, Lieut. Col. F. A. Delano, Major W. S. Franklin, Major E. G. Bliss, director of military affairs; and Capt. J. D. W. Melvin, historical officer of the Transportation Corps. Maj. Bliss is a West Point and regular army man, and Capt. Melvin until the war was a daily newspaper man, but both during their service in the Transportation Corps have acquired a broad knowledge of railway matters. The writer also acknowledges kind co-operation and assistance from Brigadier-General Connors, Chief of Staff to the Commanding General of the Service of Supply.

Railway Supply Heads in War-Time Activities

Performed Important Service in Army, on Shipping Board
and on War Industries Board

LIKE THE RAILROADS, railway supply companies contributed large numbers of men of all classes to the fighting forces and other direct war activities of the country. A host of these won marked distinction in various fields of patriotic endeavor, but because of lack of space it has been necessary to limit this article to a discussion of the direct war work performed by the presidents and chairmen of boards of railroad materials industries in the United States. The high quality of the services rendered by these men is typical of that which characterized the efforts of other members of the supply fraternity, in all branches of the industry.

The greatest number of railway supply executives who entered government service joined some division of the army, usually as commissioned officers. Our records show that at least 11 joined the military branch, seven served on the War Industries Board, three on the Emergency Fleet Corporation, and two with the American Red Cross.

Charles M. Schwab, chairman of the Bethlehem Steel Company and director general of shipping of the United States Shipping Board Emergency Fleet Corporation during the war, was one of the most prominent men before the public during the conflict. The results he achieved for the government are well known. Another of the most powerful officials in the country during the war was J. L. Replogle, president of the American Vanadium Company and chairman of the Wharton Steel Company, who was director of steel supply of the War Industries Board. With him rested the final decision as to the allocation of steel among the consuming industries of the country.

Another important officer of the Emergency Fleet Corporation was drawn from the ranks of the supply industry. Charles Piez, president of the Link Belt Company, Chicago, was made vice-president of the Fleet Corporation in the latter part of 1917, vice-president and general manager in August, 1918, and director general of shipping recently, to succeed Mr. Schwab. Another Chicago man, Edward F. Carry, president of the Haskell & Barker Car Company, served as director of operations of the United States Shipping Board from October, 1917, until July, 1918, when he was appointed chairman of the Port and Harbor Commission.

The large cantonment construction projects which were brought to completion in record time were built under the direction of a railway supply man. Warren R. Roberts, president of Roberts & Schaefer Company, Chicago, was placed in charge of the Construction Division of the army which did this work in the summer of 1917. He was promoted from major to lieutenant-colonel in May, 1918.

Samuel P. Bush, president of the Buckeye Steel Castings Company, Columbus, Ohio, was during the period of the war director of the Facilities Divisions, War Industries Board and chairman of the Division of Forgings, Guns, Small Arms and Small Arms Ammunition. J. Rogers Flannery, president of J. Rogers Flannery & Co., Pittsburgh, was chairman of the Committee on Railway Supplies of the War Industries Board. The secretary of the Committee on production of that board was J. M. Hansen, president of the Standard Steel Car Company, Pittsburgh.

The splendid work done by American railroad engineers in the construction of new lines in France is common knowledge, but it is not so generally known that a railway supply man assisted the director general of military railways, who was in charge of that work, throughout the period of the war.

E. N. Sanctuary, president of the Oxy-Acetylene Appliance Company, served in the office of S. M. Felton at Washington, when the latter was organizing railway engineering units for service abroad. Mr. Sanctuary was commissioned major in the Engineer Officers Reserve Corps.

J. M. Hopkins, chairman of the board of the Camel Company, Chicago, served as a member of the Priorities Committee of the War Industries Board at Washington, and in that capacity handled all export matters except those for Japan and for the allied governments having war missions.

Guy E. Tripp, chairman of the board of the Westinghouse Electric & Manufacturing Company, New York, was at first commissioned colonel in the production division of the Ordnance Department of the army, and was later promoted to the rank of brigadier-general and placed in control of the offices having charge of the production of ordnance material in their respective sections of the country. Other railway supply executives who served in the army include Cameron C. Smith, chairman of the Union Steel Casting Company, Pittsburgh, who was a major in the Ordnance Reserve Corps; W. K. Palmer, president of the W. K. Palmer Company, Kansas City, Mo., major in the Engineers Corps; E. A. Simmons, president of the Simmons-Boardman Publishing Company, regional constructing quartermaster, with the title of major; Lincoln Bush, consulting bridge engineer, New York, colonel in the Construction Division Quartermaster's Corps; Robert F. Carr, president of the Dearborn Chemical Company, Chicago, major, Department of Purchases, Storage and Traffic; W. W. Coleman, president of the Bucyrus Company, South Milwaukee, Wis., special representative in the office of the Chief of Ordnance, Washington, D. C.; and Warren Corning, president of Warren Corning & Co., Chicago, aide-de-camp to the chief of engineers of the United States Army, with the rank of captain.

Robert Patterson Lamont, president of the American Steel Foundries, Chicago, responded to the call of the government by assuming the duties of assistant chief in the Procurement Division of the Ordnance Department at Washington, with the rank of lieutenant-colonel. Later he was promoted to division chief of ordnance.

A. L. Humphrey, president of the Union Switch & Signal Company and vice-president and general manager of the Westinghouse Air Brake Company, Pittsburgh, served throughout the war as a member of the Labor Advisory Committee of the Council of National Defense. Alexander C. Brown, president of the Brown Hoisting Machinery Company, Cleveland, Ohio, was chief of the Locomotive Crane Section and assistant to the commissioner of finished products on the War Industries Board. Sheldon Carey, president of the Browning Company, Cleveland, was chairman of the committee of the War Industries Board which was charged with the responsibility for keeping up the production of locomotive cranes in this country early in the war.

Otis Cutler, chairman of the American Brake Shoe & Foundry Company, New York, served the American Red Cross at Washington as director of the Bureau of Insular Possessions. F. A. Poor, president of the P. & M. Company, Chicago, was also in the service of the Red Cross. W. W. Boyd, president of the Unit Construction Company, St. Louis, Mo., was with the Emergency Fleet Corporation during the war.

UNITED STATES



220,000

RAILROADS

Nearly Quarter Million Men in Service

Reports from American Lines Indicate
That Approximately 220,000 Em-
ployees Joined the Colors

CANADIAN



34,000

RAILROADS

APPROXIMATELY 220,000 railroad men, or 12 out of every 100 employed on the railroads in the United States, responded to their country's call for defenders in its time of need. Data recently received from 190 roads, representing a combined operated mileage of 186,488, or 67 per cent of the mileage of the country, show that 152,450 railroad officers and employees had left the service to join the colors. Assuming that the remaining lines of the United States contributed a proportionate number of men to the army and navy, over 74,000 additional honor men are accounted for. Reports received from roads representing 78 per cent of the country's mileage just one year ago indicated that nearly 71,000 railway men had joined the armed forces of the nation up to that time. Enlistments were much heavier in 1918, being twice the number for the first year of our participation in the war.

The railroads of Canada, which bore the burdens of war much longer than this country, also made enviable records, contributing approximately 34,000 men to the conflict. The Canadian Pacific system gave 9,661 to fight the cause of the Dominion and the Grand Trunk system has 4,846 stars on its service flag, 816 of which represent enlistments in the United States military and naval forces.

Some individual American lines were exceptionally heavy contributors to the nation's armed forces. The Pennsylvania system leads with a total of 24,487 in service at the conclusion of hostilities, or 15,468 more than at the end of the year 1917.

The New York Central system reported that 15,374 officers and employees had joined the army or navy during the war, as compared with a total of 7,143 who had enlisted up to the end of 1917. The Illinois Central system is third in rank with enlistments totalling 8,775, or 6,859 in excess of the number on the service flag a year ago. The Baltimore & Ohio system reports an honor roll of 5,731 as compared with 1,760 at the end of 1917.

Other roads which gave large numbers of employees to the colors are the Chicago & North Western, 5,386 men (1,573 in 1917); the Atchison, Topeka & Santa Fe, 5,383 men (3,000 in 1917); the Union Pacific system, 5,333 (2,008 a year ago); the Southern Pacific, west of El Paso, 5,142 (1,874 in 1917); the Chicago, Burlington & Quincy, 4,874 (1,486 in 1917); the Chicago, Milwaukee & St. Paul, 4,000 men (1,645 a year ago); the Rock Island system 3,838 (1,457 in 1917). The remaining lines with honor rolls containing more than three thousand names are as follows: the Erie, 3,576 (1,375 in 1917); the Northern Pacific, 3,543 (1,638 in 1917); the Boston & Maine, 3,284 (1,201 in 1917); the New York, New Haven & Hartford—including the Central New England—3,199 (1,446 in 1917), and the Philadelphia & Reading, 3,000 men (1,283 in 1917).

The following is a partial list of the roads and the number of their employees who entered military or naval service:

AMERICAN LINES.

Name of railroad	Number of employees in military or naval service
Abilene & Southern	3
Ahnapee & Western	72
Alton & Southern	10
Alabama, Tennessee & Northern	37
Apalachicola Northern	45
Arizona Eastern	146
Atchison, Topeka & Santa Fe	5,383
Atlantic Coast Line	2,150
Augusta Southern. (See Georgia & Florida.)	
Baltimore & Ohio	5,478
Baltimore & Ohio, Chicago Terminal	253
Bangor & Aroostook	154
Beaumont & Great Northern and Trinity Branch of M., K. & T. of Texas	47
Belt R. R. of Chicago	215
Bessemer & Lake Erie	418
Birmingham & Northwestern	10
Boston & Albany	558
Boston & Maine	3,284
Buffalo Creek	10
Buffalo, Rochester & Pittsburgh	850
Central Indiana	15
Central New England. (See N. Y., N. H. & H.)	
Central of Georgia	750
Central of New Jersey	720
Central Vermont	248
Charlotte Harbor & Northern	16
Chesapeake & Ohio (east of Louisville)	2,470
Chesapeake & Ohio of Indiana	312
Chicago & Eastern Illinois	1,169
Chicago & North Western	5,386
Chicago & Western Indiana	174
Chicago, Burlington & Quincy	4,874
Chicago Great Western	958
Chicago Heights Terminal. (See Baltimore & Ohio Chicago Terminal.)	
Chicago, Indianapolis & Louisville	356
Chicago Junction	300
Chicago, Milwaukee & St. Paul	4,000
Chicago, Ottawa & Peoria	29
Chicago, Rock Island & Pacific (including Chicago, Rock Island & Gulf)	3,838
Chicago, St. Paul, Minneapolis & Omaha	1,127
Chicago, Terre Haute & Southeastern	150
Cincinnati, Indianapolis & Western	138
Cincinnati, Lebanon & Northern	40
Cleveland, Cincinnati, Chicago & St. Louis	1,986
Clinton, Davenport & Muscatine	7
Colorado & Southern	287
Colorado, Wyoming & Eastern	6
Columbia, Newberry & Laurens	30
Copper River & Northwestern	50
Davenport, Rock Island & Northwestern	10
Delaware & Hudson	1,253
Delaware, Lackawanna & Western	2,289
Denver & Rio Grande	719
Detroit, Toledo & Ironton	206
Duluth & Iron Range	316
Duluth & Northern Minnesota	11
Duluth, Missabe & Northern	367
Duluth, South Shore & Atlantic and Mineral Range	275
Durham & Southern	9
East Broad Top Railroad & Coal Co.	10
East Carolina	5
Elgin, Joliet & Eastern	1,026
El Paso & Southwestern	345
El Paso Union Passenger Depot Co.	5
Erie	3,576
Evansville & Indianapolis	35
Fairchild & Northeastern	1
Flint River & Western	8
Fort Worth & Denver City	78
Gainesville Midland	7

Name of Railroad	Number of employees in military or naval service
Galveston, Houston & Henderson	7
Georgia & Florida and Augusta Southern	94
Georgia Northern	27
Georgia Coast & Piedmont	15
Grand Rapids & Indiana	243
Grand Rapids, Grand Haven & Muskegon	21
Great Northern	2,550
Gulf, Texas & Western	14
Hocking Valley	454
Houston & Brazos Valley	3
Houston & Texas Central	131
Hudson & Manhattan	259
Illinois Central (including Yazoo & Mississippi Valley)	8,775
Illinois Southern	56
Illinois Terminal and Missouri & Illinois Bridge and Belt	16
Indiana Harbor Belt	410
Indianapolis Union	80
International & Great Northern	215
Kanawha & Michigan and Kanawha & West Virginia	255
Kansas City Northwestern	272
Kentucky & Indiana Terminal	98
Kentwood & Eastern	21
Lake Charles & Northern	10
Lake Erie & Eastern	23
Lake Erie & Western	323
Lehigh & Hudson River	56
Lehigh & New England	130
Lehigh Valley	2,049
Litchfield & Madison	14
Long Island	725
Lorain, Ashland & Southern	12
Los Angeles & Salt Lake	388
Louisiana & Northwest	52
Louisville Bridge & Terminal	39
McCloud River	8
Maine Central (including Portland Terminal)	887
Michigan Central	1,863
Mineral Range. (See Duluth, South Shore & Atlantic.)	
Minneapolis & St. Louis	674
Minneapolis Eastern	1
Minnesota Transfer	171
Mississippi River & Bonne Terre	44
Missouri & Illinois Bridge & Belt. (See Illinois Terminal.)	
Missouri, Kansas & Texas (north of Red River)	706
Missouri, Kansas & Texas of Texas	644
Mobile & Ohio	808
Monongahela	45
Monongahela Connecting	150
Nevada-California-Oregon	27
Nevada Northern	59
New York & Long Branch	22
New York Central	9,321
New York, Chicago & St. Louis	517
New York, New Haven & Hartford (including Central New England)	3,199
New York, Ontario & Western	385
Norfolk & Portsmouth Belt Line	32
Norfolk & Western	2,461
Northern Pacific	3,543
Northwestern Pacific	241
Ocean Shore	4
Ohio River & Western	12
Oklahoma Railway	95
Oregon Electric. (See Spokane, Portland & Seattle.)	
Oregon Short Line	1,369
Oregon-Washington Railroad & Navigation Lines	954
Oregon Trunk. (See Spokane, Portland & Seattle.)	
Pacific & Idaho Northern	6
Pennsylvania Lines West of Pittsburgh	6,624
Pennsylvania Railroad—Eastern Lines	16,831
Philadelphia & Reading	3,000
Pittsburgh & Lake Erie	750
Pittsburgh & West Virginia and West Side Belt	75
Rio Grande Southern	20
Richmond, Fredericksburg & Potomac and Washington Southern	375
Rock Island Southern	37
Rutland	181
St. Joseph & Grand Island	160
St. Louis National Stock Yards Railroad	13
St. Louis Southwestern of Texas	117
St. Louis, Troy & Eastern	13
St. Paul Bridge & Terminal	10
St. Paul Union Depot	67
Salina Northern	2
San Diego & Arizona	62
San Francisco-Oakland Terminal Railways	162
Sibley, Lake Bisteneau & Southern	2
South Georgia	10
Southern Railroad in Mississippi	73
Southern Pacific (west of El Paso)	5,142
Southern Railway	5,487
Spokane, Portland & Seattle (including Oregon Trunk and Oregon Electric)	213
Staten Island Rapid Transit	250
Susquehanna & New York	7
Terminal Association of St. Louis and affiliated lines	600
Texas & Pacific	790
Tidewater Southern	3
Toledo & Ohio Central and Zanesville & Western	466
Toledo, Peoria & Western	66
Toledo, St. Louis & Western	210
Toledo Terminal	21
Tonopah & Tidewater	11
Trans-Mississippi Terminal	143
Trinity & Brazos Valley	37
Ulster & Delaware	51
Union Pacific	2,850
Utah Railway	6
Wabash	1,634

Washington & Old Dominion	44
Washington Southern. (See Richmond, Fredericksburg & Potomac.)	
Weatherford Mineral Wells & North Western	5
West Side Belt. (See Pittsburgh & West Virginia.)	
Western Pacific	282
Wheeling & Lake Erie	248
Wichita Falls & Northwestern	62
Wichita Valley	33
Wisconsin & Michigan	9
Woodworth & Louisiana Central	1
Yazoo & Mississippi Valley. (See Illinois Central.)	
Zanesville & Western. (See Toledo & Ohio Central.)	

CANADIAN LINES

Atlantic, Quebec & Western	10
Algoma Central & Hudson Bay	38
Canadian Government Railways	2,409
Canadian Northern	3,500
Canadian Pacific	9,661
Grand Trunk Railway System	4,846*
Quebec Oriental Railway	12

*Of this number, 816 cover enlistments in U. S. Army and Navy; the balance, Canadian Expeditionary Forces.

A Bill to Render Justice to Contractors

REPRESENTATIVE S. HUBERT DENT, JR., of Alabama, on December 7 introduced a bill in Congress to provide relief where formal contracts have not been made in the manner required by law for contractors who have undertaken work for the government during the war emergency. The bill was referred to the Committee on Military Affairs and on December 19 was reported with an amendment back to the house, but has not yet been passed. The bill provides that Congress authorize the secretary of war to pay or discharge any agreements, expressed or implied, made in good faith by any officer or agent for the acquisition of land or materials when the agreement has been executed in whole or in part, or where expenditures have been made or obligations incurred in good faith. The bill protects the government against fraud and is not a bar to the recovery of money if the government has been defrauded.

The following letter has been sent out by the Symington Chicago Corporation, Symington Machine Corporation, Symington-Anderson Company, Symington Forge Corporation, and the 75 mm. Shell Association, American Fuse Manufacturers' Association, Committee on Boosters and Adapters:

1. On November 25, 1918, Comptroller Warwick ruled:

"There are in the hands of contractors many informal papers, such as *letters, purchase orders, procurement orders*, etc. These papers generally are intended to be and are preliminary to the execution of contracts. *In themselves they place no obligation on the government.* The latter may be liable on a *quantum meruit* for the fair value of articles delivered and accepted, but it has no legal obligation for expenses incurred, value of incomplete work, material on hand or arranged for, etc., unless a contract in legal form has been made. Of course, it is understood a legal contract can not be made now for articles the government does not need, and this is true regardless of prior negotiations or understandings, written or oral."

2. The claims board and the district ordnance offices have ruled that the government will deal only with prime contractors.

This means that, instead of checking the sub-contractors' claims in advance, the government wants the prime contractors to settle with the sub-contractors, and assume the risk that such settlement would later be approved by the government.

3. Only legislation by Congress can relieve the situation created by the comptroller's ruling.

4. If, as we believe, the government will ultimately have to check sub-contractors' claims before repaying to the prime contractors their disbursements on this account, why should not this government checking be done now, before the sub-contractors' material is stored and their cost records scattered?

We believe that pressure should be brought on the claims board to check sub-contractor's claims now.

5. In order to impress Congress and the country with the importance of immediate action if industrial disaster is to be averted, a meeting of prime and sub-contractors on government work will be held at the Hotel Cleveland, Cleveland, Ohio, on Friday, January 3, 1919, at 11 a. m., for the purpose of, (a) adopting a resolution requesting Congress to pass legislation at once legalizing payment on so-called informal contracts; (b) of urging on the claims board that claims of sub-contractors be checked and approved by government accountants immediately.

Railway Revenues and Expenses in 1918

Record Breaking Revenue But Net Income Nearly \$250,000,000
Under Government Guarantee

By Julius H. Parmelee
Chief, Bureau of Railway Economics

TEN YEARS HENCE the railway historian will analyze the results of the year 1918 with a perspective born of full knowledge of intervening events. He will review the events of 1918 in their proper relationship to preceding and succeeding years. To those of us, however, who glance backward over the year as we cross the threshold into 1919, the task of interpreting its record of swift changes is doubly difficult; difficult both because 1918 was a year of unique and unprecedented happenings, and because we cannot yet see how it will be linked with the years that are ahead.

In particular, discussion of the financial results of 1918 is made difficult by appearance for the first time in American railway history of a governmental guarantee of net income. The injection of this and other accompanying factors into the situation leads to several results: for one thing it makes comparison with earlier periods of less significance, inasmuch as the year's net income is fixed and predictable months in advance of December 31; for another, it renders the aggregates of revenue and expense less susceptible to analysis, since the rates underlying railway revenues and the wages and prices underlying railway expenses have been subjected to such unnatural and sudden changes that the revenue and expense totals have temporarily ceased to serve as adequate standards of traffic and operation; still again, emphasis has shifted from conjecture regarding the amount of net income—for that is now fixed—to estimate of the amounts which the government will be called upon to turn over to railway corporations under its guarantee. Bearing in mind these difficulties and changes in emphasis, let us turn to the finances of the American railways, as set forth in their revenue and expense accounts for 1918, and interpret them as best we may in the light of existing information and potential developments.

Briefly stated, the year 1918 was one of record revenues and record expenses, but with net income lower than for any year since the fiscal year 1915, and nearly \$250,000,000 under the annual amount guaranteed by the Railroad Control Act of March 21, 1918.

Railway revenues and expenses for 1918 broke all records. Revenues approached the five billion-dollar mark, while expenses reached almost to four billions. Railway revenues had crossed the four-billion-dollar line for the first time in 1917; during 1918 they increased over \$800,000,000 above the 1917 total. Not only was the 1918 aggregate a record, but the increase of five-sixths of a billion dollars over the preceding year was the greatest single year's increase in the history of American railways. Similarly, operating expenses

surpassed all other years both in aggregate amount and in the amount of increase during the year. Railway expenses for 1918 amounted to nearly four billions, whereas in 1917 they had been \$2,854,000,000; the increase of one and an eighth billions over 1917, as in the case of revenues, was a record for the increase of a single year.

Normal taxes, exclusive of special war levies, increased to \$190,000,000 in 1918, also a record. This was about \$10,000,000 more than the normal taxes charged against railway income in 1917. The exact amount of war taxes paid by the railways in 1917 has not been reported by the Interstate Commerce Commission; the total was probably in the neighborhood of \$40,000,000; what will finally be charged against the railway income of 1918 depends on two factors not as yet fully determined, namely, the tax rate applicable under the war revenue bill now pending in Congress, and the extent to which railway companies are able to charge the special levies of 1917 and 1918 in the income accounts of those two years. The war taxes payable by the railways on their income for 1918 will be a charge against the railway corporations, while normal taxes are met by the United States Railroad Administration before arriving at the net income guaranteed to the roads.

The final resultant of the year's operations was that net income, the "standard return" as defined by the Railroad Control Act, declined from \$974,000,000 in 1917 to \$687,000,000 in 1918, a decrease of \$287,000,000, or thirty per cent. This \$687,000,000 is nearly \$250,000,000 less than the average net income of the same roads during the three-year test period, which formed the basis of the government's guarantee. In other words, the United States Railroad Administration will be called upon to make up a deficiency of that amount out of government funds.

The statistical data presented in the foregoing paragraphs are set forth in somewhat greater detail in Table I, which is a comparative income account of the railways of Class I, or so-called "million-dollar" roads, (including switching and terminal companies), for the years 1917 and 1918. The aggregates for 1918 are necessarily estimated in part, as only preliminary returns for November are available as this review is written, and only partial returns for December. The tax entry for 1917 is also estimated in part, owing to the fact already noted that the Interstate Commerce Commission has not yet reported the war taxes of that year.

TABLE I

Item	1918	1917	Increase or decrease	
			Amount	Per cent
Operating revenues....	\$4,880,000,000	\$4,043,000,000	\$837,000,000	20.7
Operating expenses....	3,975,000,000	2,854,000,000	1,121,000,000	39.3
Net revenue	905,000,000	1,189,000,000	d 284,000,000	d23.9
Taxes	190,000,000	180,000,000	10,000,000	5.6
Net rental balances....	Dr. 28,000,000	Dr. 35,000,000	7,000,000	20.0
Net operating income..	687,000,000	974,000,000	d 287,000,000	d29.5

d = Decrease.

Discussing first the year as a whole, the facts that press for attention are the great increase in revenues, the still greater increase in expenses, and the resultant decline of \$287,000,000 in net operating income. Revenues increased \$837,000,000; every month except January showing an increase over the corresponding month of 1917. Table II makes it clear that the monthly increases were accelerated



Julius H. Parmelee

from January up to August and September, due largely to the speeding up of war traffic during the spring and summer months, while there was a slackening during the later months of the year. The general rate increases made effective in March and during June played their part, of course, in the increased revenues, especially during the last half of the year from July to December.

TABLE II

Month	Operating revenues (000 omitted)		
	1918	1917	Increase
January	\$285,084	\$300,841	\$15,760
February	289,684	265,362	24,322
March	365,912	317,150	48,762
April	370,615	319,328	51,287
May	378,242	345,904	32,338
June	393,309	349,670	43,639
July	468,380	348,394	119,986
August	502,760	366,224	136,536
September	488,136	358,798	129,338
October	489,500	381,000	108,500
November	445,000	355,000	90,000
December	403,500	335,500	68,000
Twelve months	\$4,880,122	\$4,043,174	\$836,948

The principal rate increases of the year 1918 were the 25 per cent flat increase in freight rates made effective by the director general on June 25, and the general passenger rate increases of June 10. Passenger rates were increased to three cents a mile wherever they were below that figure, while an additional tariff of half a cent per mile was added to the passenger charge when the traveller carried a Pullman ticket. This extra tariff on Pullman travel was removed on December 1. On March 25, the Interstate Commerce Commission made effective in Official Classification Territory a large part of the increases not already allowed in the course of the Fifteen Per Cent Case; on June 22 the Commission granted a 10 per cent increase in express rates, the railroads' proportion of which increased in similar ratio. These principal increases, together with many minor adjustments and some changes in accessory charges, accounted for probably not less than \$600,000,000 of the total increase in revenues, amounting to \$837,000,000. The balance came from increase in traffic, which was relatively greater in the passenger than the freight service.

Passenger-miles increased approximately 15 per cent, a large part of this increase representing troop movements. In other words, what may be termed normal passenger travel remained almost stationary. Troop movements were especially heavy in the summer months, but grew less extensive during the later months of the year, both on account of the armistice of November 11 and on account of restriction of railway travel made necessary by the influenza epidemic. This last factor also affected normal travel, especially in October and November. December travel showed a number of vagaries; consolidated troop movements were heavy, and there was also a large movement of discharged soldiers returning home on their own account. These men received a reduced rate of two cents per mile, so that the revenue derived from their travel was not so great, relatively, as from other classes of passengers. Probably half a million discharged soldiers returned to their homes during December. Normal travel was also heavy in December. The increase in passenger travel during 1918, all classes combined, produced revenue well above \$100,000,000, possibly close to \$150,000,000.

Freight traffic, up to October, was only slightly greater than during the corresponding period of 1917. What increase may have occurred during the last two months of the year, together with the increases up to October, probably brought into the treasuries of the federal roads an amount approaching \$100,000,000.

Revenue from the carriage of mail showed a slight but consistent decline throughout the year, the total decrease approaching five millions. Express revenue increased nearly \$25,000,000.

Railway operating revenues for 1918 have been estimated

above at \$4,880,000,000. These were distributed among the several classes of service as follows:

Freight revenue	\$3,400,000,000
Passenger revenue	1,040,000,000
Mail	55,000,000
Express	130,000,000
All other	255,000,000
Total revenues	\$4,880,000,000

The increase in the various forms of railway revenue, reduced to the basis of percentages of increase over the year 1917, are shown by months in Chart I.

Operating expenses as a whole increased \$1,121,000,000 in 1918. In some respects this increase over the already heavy expense of 1917 stands out as the one significant feature of the year's operations. The rate of increase was nearly 40 per cent as compared with 1917, and 67 per cent as compared with 1916. The increase was due primarily to increased wages, secondarily to the higher cost of fuel and other supplies, and finally to the additional costs brought about by heavier traffic.

Wage increases accounted for considerably more than half of the total increase in expenses. Five general wage in-

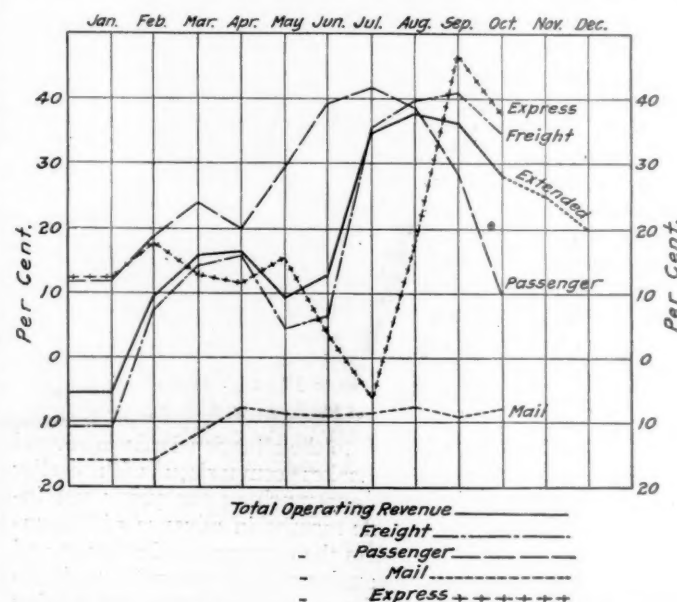


Chart I—Rate of Increase or Decrease of General Revenue Accounts by Months, 1918 Compared with 1917. Only Decrease Was for Mail

creases were granted by the director general of railroads during 1918, and there were many minor and local adjustments as well, virtually all of them in the upward direction. The principal increases, together with the annual amounts which they are roughly estimated to have added to the railway payroll, were as follows.

A general increase to all railway employees receiving less than \$250 per month was granted by General Order No. 27, promulgated May 25. This increase was retroactive to January first, and represented a payroll addition estimated from \$300,000,000 to \$350,000,000 per year. The second principal increase, also retroactive to January 1, was that to shopmen announced on July 25. This increase has been estimated at not less than \$125,000,000 per year. The third and fourth increases were made effective September first, and affected the wages of maintenance of way employees and of clerks, respectively. These two increases aggregated some \$150,000,000 per year. The fifth increase became effective October first and applied to telegraphers, towermen, block and telephone operators, etc. This increase amounted to \$30,000,000 or more per year. These principal increases, together with many smaller adjustments, accounted for a total

addition to the railway payroll variously estimated at from \$600,000,000 to \$700,000,000.

Increased cost of fuel represented another considerable addition to operating expenses. Railway locomotives consumed some 650,000,000 tons of fuel in 1918. The average price paid by the roads was higher in 1918 than in 1917 by an amount not yet fully known. It may have been as great as fifty cents per ton, in which case the increased cost of fuel due to increase in unit prices would be about \$80,000,000.

Other supplies increased also in cost, some of the per-unit increases ranging well above 100 per cent. The total

of ticket and other agencies, and other practicable economies under the conditions of unified operation. Maintenance expenditures increased over 50 per cent, maintenance of equipment increasing over 60 per cent and maintenance of way about 40 per cent. Transportation expenses were greater by 35 per cent.

The customary comparison of monthly expenditures with those of the preceding year offers but little interest in the case of the year 1918, because the retroactive features of the two largest increases in wages tend to overweight the expense accounts of some months and underweight those of other months. Chart II portrays the rate of increase over 1917 of the various classes of expense, by months, and shows very clearly how much out of line were certain of the months. Some of these variations from normal can be traced back definitely to one or more of the five principal wage increases. For example, the chart marks a sudden upward trend in all the expense accounts for June, the month in which the larger part of the back pay resulting from the general increase of May 25 was charged. The rate of increase approached more nearly to normal in July, but in August, September and Oc-

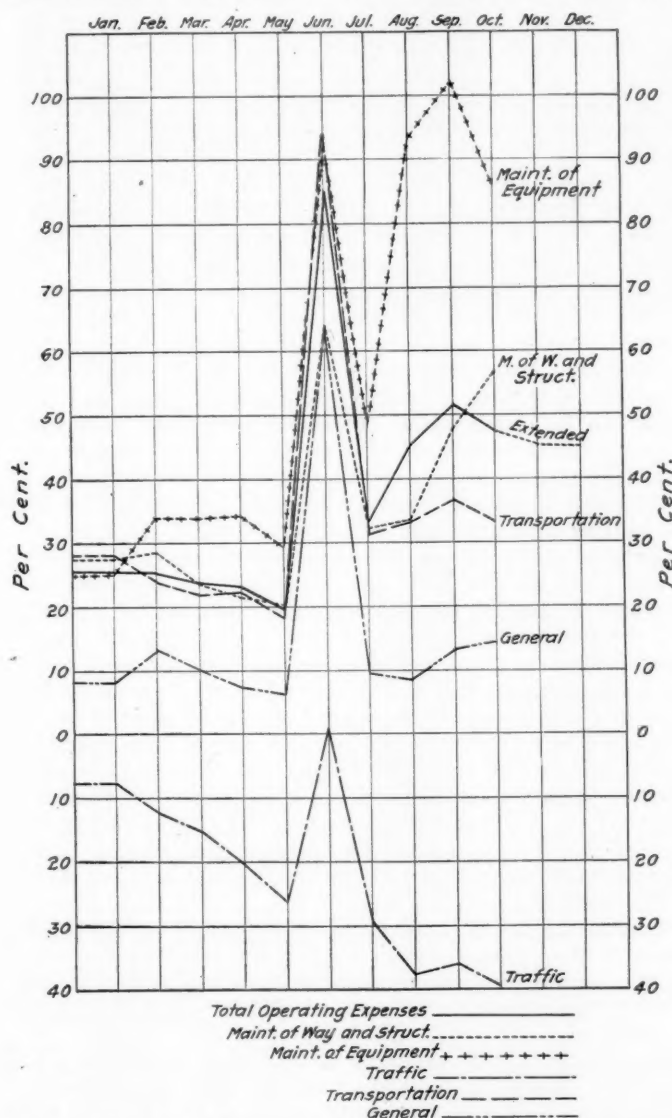


Chart II—Rate of Increase or Decrease of General Expense Accounts by Months, 1918 Compared with 1917. Only Decrease Was in Traffic Account

amount of such increases is not easily computable, but in the aggregate it represented a considerable item. Still another factor of increased operating expense, as in the case of revenue, was the increase in traffic.

The principal operating expense accounts were as follows:

Maintenance of way and structures.....	\$620,000,000
Maintenance of equipment	1,100,000,000
Traffic	50,000,000
Transportation	2,050,000,000
General and other	155,000,000
Total expenses	\$3,975,000,000

All these accounts except traffic showed heavy increases over 1917. Traffic expenditures fell off over 20 per cent, owing to the abolition of traffic solicitation, consolidation

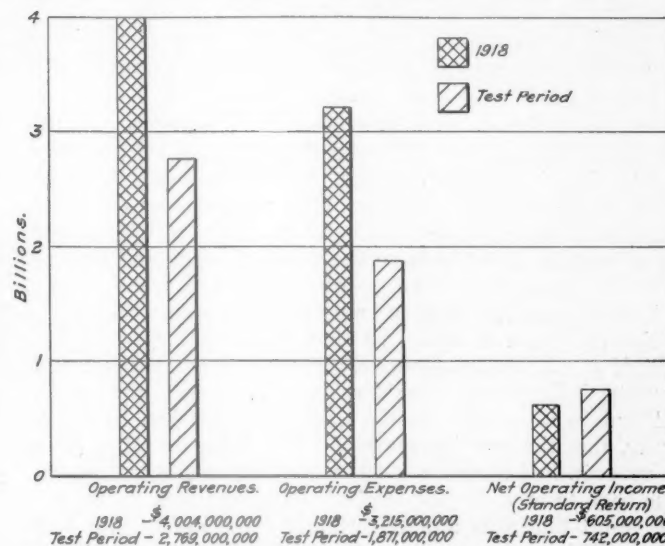


Chart III—Revenues, Expenses and Net Operating Income for Ten Months to October, 1918, Compared with Ten-Twelfths of Test Period

tober maintenance of equipment expenses show unusually large increases. Part of this abnormal showing grew out of the retroactive feature of the shopmen's increase of July 25. The general ordermaking this increase effective provided that the July increase should be charged in the July accounts, while the increase for the six months from January to June should be brought into the accounts as soon as possible after August 1. Some roads did not succeed in computing and charging the back pay in full until September and even October. The maintenance of way increase of September 1 is clearly reflected in the jump in maintenance of way expenses, from a 33.5 per cent increase in August to a 47.5 per cent increase in September. The other wage increases cannot be so closely traced in the expense statements, either because they were scattered through the various accounts, as in the case of the clerks, or because they did not represent a relatively large addition to total expense, as was the case with the telegraphers.

Finally we come to the vitally significant item of net operating income, or standard return. This amounted in 1918 to \$687,000,000, which was a decline of \$287,000,000 from the results attained in 1917. The calendar year 1917 as a whole, however, showed better results than the average year of the three-year test period selected by Congress as the basis of its guarantee of net income. As a consequence the

deficiency which the director general's revolving fund will be called upon to make up is not the difference of \$287,000,000 between the results of 1918 and 1917, but rather the difference of about \$250,000,000 between 1918 and the annual average of the test period. I say "about \$250,000,000," since only a few of the compensation contracts have been signed as this is written, and there is some question as to what amounts will be guaranteed a number of the roads, although in many other cases the amount is, of course, virtually agreed upon even though the formal contract has not been completed.

To portray somewhat more clearly to the eye how the tremendous increase in expenses affected net operating income in 1918, Chart III has been drafted, showing for the first ten months of 1918 the total revenues, total expenses, and net operating income of roads of Class I, as compared with ten-twelfths of the test period average. Switching and terminal companies are not covered by this chart, and the results should not be compared in detail with the other charts and the tables, which do include such companies. The general results, however, are not affected by the exclusion. Revenues in 1918 far outstripped those of the test period, but as expenses increased in even greater ratio, net operating income shows a very appreciable decline.

If it has been difficult to analyze the results of 1918, even more difficult is it to offer predictions regarding 1919. So many uncertainties face the American railways on the threshold of a new year that even the most guarded prophecy might easily be upset overnight. Among the vital questions pressing for answer are these: Will unified operation and control continue through 1919? What traffic will be offered the railways? What will be the trend of wage and prices? Will the increased rates be maintained? And many others. If I were permitted a very cautious guess as to the possibilities for 1919, it would be that traffic will decrease but little, if at all, in the aggregate, although its composition and character will change considerably; that wages and prices will remain at or close to the high levels reached in 1918; finally, that the rate increases of 1918, being in effect from the very first of the year 1919, will bring net operating income back to or above the level of the government guarantee. One result that will almost certainly come out of this last factor will be a demand from the public for rate reductions. This point was recently touched upon by Director General McAdoo, when he predicted that the extension of unified control would make possible substantial reductions in both freight and passenger rates. However this may be, rates, prices, wages, and traffic will certainly react on each other, the final result being a matter that lies today on the lap of the gods.

Engineering and Operating Problems of English Railways

SIR JOHN A. F. ASPINALL, general manager of the Lancashire & Yorkshire, has been chosen president of the Institution of Civil Engineers, and in his inaugural address, delivered before that body in London, on November 5, he made an interesting survey of some of the weighty problems now confronting the engineering profession in England.

More than 3,000 members of the institution have joined the fighting forces of the Empire, and 307 military orders and distinctions have already been conferred upon them; the number who have lost their lives is 291. Nearly one-half of the whole number—1,430—have been commissioned as officers of the Royal Engineers. The speaker mentioned with gratification the general recognition of the important service rendered in the war by the engineering profession—mathematicians, chemists, physicists, metallurgists and electricians—who are to be credited with rapid progress in de-

feating every hostile invention. The railways have not felt the deadening effect of government operation, as have other great industries, largely because the work has not been taken out of the hands of the men familiar with it.

The first problem considered by Sir John was that of the structure gage of British railways, there being 66 different loading gages applicable to 150 sections of lines; and the list of these must be studied when sending freight cars off from their home road. Progress in making larger freight cars is slow and at present almost impossible because of the limitations in width and height imposed at a thousand places. During the war English cars have been sent to France and have been run with facility, but French cars could not be run far in England. The speaker believed it possible to make great improvements in the structure gage without in any way altering the space between the two tracks of a double-track railway, which in most cases is six feet. He offered no specific remedy for this general problem but said that this and also the standardization of locomotives and cars ought to be actively undertaken; and "any change which may take place in the ownership of railways" ought to lead to an active policy; which probably would not cost more than a few days' war expenditure. The speaker had nothing definite to say concerning proposed amalgamations or state ownership, but alluded to the probable limitation of the number of designs of engines, if any change should be made. As to cars, running gear, brake gear, and some other details ought to be standardized without regard to whether more comprehensive plans can be agreed upon. Extended quotations are made from the recent address of Alba B. Johnson, at Chicago, on standardization.

Improved appliances for unloading coal at seaports, and for loading and unloading other heavy goods; the need of larger coal cars and the importance of abolishing private ownership of freight cars, and thus promoting standardization on the part of the railroads, are discussed at length; and the speaker then proceeded to discuss permanent way. Wooden sleepers (ties) are less plentiful than formerly, and are costing more; and it is suggested that when the steel mills of the kingdom are released from the burdens of war, they might be used to make the 300,000 tons of steel sleepers which could be used annually to replace the 4,500,000 wooden sleepers which need to be taken out each year. The speaker seems to hold that standard dimensions could be agreed upon for steel sleepers throughout the kingdom, and suggests that their use might become as extensive in England as it is today on the continent.

Another suggestion based on recent experience on the continent, is that light railways might be laid extensively in Britain for the development of agriculture; the hundreds of miles of 60-centimeter gage track which has been laid by the British army in France and Belgium might profitably be used in England. A committee of engineers and road surveyors, in combination with the Board of Agriculture, could decide where and how such railroads should be laid to be most useful.

Looking to the future and considering the probability of greatly lengthening freight trains, Sir John calls attention to the fact that wireless telephones will probably be available so that the engineman at the head of a train can communicate instantaneously with the runner of an engine at the rear of the same train, the two stopping or starting or setting the brakes at the same instant.

The future of electrical railway operation is discussed at length, with reference principally to recent experiences in America; and, observing that the railway demand for electric current will be far in excess of that for any other industry, the speaker thought that the generating stations ought to be owned by the railway companies. England must take into account the abilities of her competitors. Countries rich in waterpower can sell electric current at low prices; and Norway today is exporting current by cable to Denmark.



Executive Committee of Canadian Railway War Board

Left to Right: Howard G. Kelley, president, Grand Trunk Railway; D. B. Hanna, president, Canadian Northern (Government) Railway; Lord Shaughnessy, chairman of the Canadian Railway War Board and chairman of the Canadian Pacific; A. H. Smith, formerly president of the New York Central, now regional director of the United States Railroad Administration, but still representing the American lines in Canada; E. W. Beatty, K. C., President, Canadian Pacific, and W. M. Neal, general secretary, Canadian Railway War Board.

The Confused Railway Situation in Canada

Present Form of Government Ownership Forced on Canada by
Circumstances; Whole Question Is Still to Be Settled

By J. L. Payne

Controller of Statistics, Ottawa, Canada

THE PRESENT SITUATION with respect to government ownership and operation of railways in Canada is the result of circumstances rather than the development of a definite policy. In so far as there was anything in the nature of a matured plan for the extension of the government system, which has been in existence for nearly fifty years, it had reference entirely to the Maritime Provinces; and the course of events in that direction will not be understood short of a clear grasp of the history of the Intercolonial. It was my privilege a year or two ago to set forth in the *Railway Age* (October 5, 1916, page 589), the essential facts with regard to that much discussed road, and it is therefore unnecessary at this time to do any more than epitomize those facts in their bearing on the position of matters today. There is sure to be confusion in the minds of readers if the historical aspect is omitted. It is fundamental, especially at this critical juncture in the discussion of railway policy in the United States and Canada.



J. L. Payne

Government did not start out in 1867 to give a demonstration of state ownership. That idea had no place whatever in the minds of those who built the Intercolonial. The principle, as against corporate control, was not even mooted. The Intercolonial, it must always be remembered, was constructed solely as an integral part of the bargain of confederation. The provinces down by the sea were reluctant to join with the upper provinces in a federal union, for a very good reason. They were cut off from central and western Canada by the closing of the St. Lawrence during the winter months. Their commercial interests were focussed in Boston and the eastern states. They were British in sentiment; but they were bound by ties of trade very closely to the United States. They felt themselves quite separated from Ontario and Quebec, and today, after the lapse of more than half a century, thousands of Nova Scotians still speak of the upper provinces as "Canada."

To win the people of Nova Scotia and New Brunswick over to the confederation idea it was necessary to offer them railway connection, and the Intercolonial was the result. The building of such a line was made a matter of specific contract in the British North American Act—the charter and constitution of the Dominion of Canada. It was to be the material link of political union, and out of that fact, without agreement on the point, grew up the idea that the road must never be regarded as a commercial undertaking. That is to say, it was tacitly understood that transportation tolls should be imposed solely for the purpose of meeting operating expenses. In practice, for reasons as to which there has been much debate, there were many years when it did not accomplish that much. Rightly or wrongly, the deficit of the Inter-

colonial were often attributed to political interference with the management. It is foreign to my purpose to discuss for one moment that phase of Intercolonial history, as it also is to write a syllable which could be construed as taking either side in the broad controversy over state ownership as a principle. I must be understood as being an entirely neutral recorder of the basic facts which have brought about the present railway situation in Canada, and nothing more.

Government began its railway enterprises with the Intercolonial, and was assumed to have ended with the building of the Prince Edward Island narrow gage line when that province entered the confederation in 1873. That was all the founders of the Dominion had in view. It was done as a matter of agreement based entirely on the necessities of the case.

The question of principle, apart from the original bargain, has no place in the official records. Other railways were built by private corporations; so that in 1903, when the Grand Trunk Pacific was projected, there were in New Brunswick and Nova Scotia 1,395 miles of line thus owned. This mileage attached to 26 separate roads, of which 9 were in Nova Scotia and 17 in New Brunswick. This will make it clear that the government had not dreamt of setting apart the Maritime Provinces as a field in which to exploit by monopoly the principle of state control. Not one of these lines paralleled the Intercolonial. They were all more or less in the nature of feeders to the government system. Almost without exception they connected with the Intercolonial. In time they came to be regarded as branch lines, although two or three of them could not properly be so classified. For the most part they served a local purpose. Few of them managed to make ends meet without a hard struggle. They constantly looked to the government road for assistance, chiefly in the way of equipment. The Intercolonial was the artery; they were the veins. In this situation there grew up an agitation for consolidation. It was believed that under such a re-casting a better service would be provided in the districts served, especially by the smaller roads, and that it would be a good thing in the long run for the government system itself.

The process of acquirement has been slow; but during the past 15 years lines have been taken over representing an aggregate of a little more than 500 miles, all in the province of New Brunswick. The basis of purchase was in essence the present value, which in some cases took the form of assuming outstanding liabilities. Under the circumstances it is quite impracticable to give either the cost to government or even a suggestion of how present value was appraised. The terms were a matter of arrangement between the government and the owners. This acquired mileage has not been added to the mileage of the Intercolonial as yet, the new properties being simply operated separately as before; and it would be altogether premature to say anything whatever about results. The bulk of the new mileage has been in possession of the government for but a short time, and as to the lines which have been operated for a number of years no change of importance is discernible in either gross or net earnings.

Extension of Government Ownership

The construction of the Grand Trunk Pacific, which was begun in 1905, marks a pivotal period in the extension of government ownership in Canada. That system was to begin at Moncton, in New Brunswick—practically at the Atlantic coast—and end at Prince Rupert on the Pacific. It will be remembered that the company was to build from Winnipeg to the Pacific coast, while the government undertook to build the eastern section, 1810 miles in length, officially designated the National Transcontinental. Without going into a considerable mass of details arising out of the bargain, let it suffice to say the construction of the Winnipeg-Moncton section was a reorganization of the form in which

the government was to aid the enterprise. The capital cost thus far has been \$170,000,000 in round figures, without including charges on account of deficits. The ultimate cost of the line, equipped for traffic up to capacity, is estimated at \$100,000 per mile. It is built up to a high standard; but runs for many hundreds of miles through an unproductive and quite undeveloped country. When the time came for the Grand Trunk Pacific to take over the National Transcontinental, thereby creating a new system from ocean to ocean, it was unable to do so. Financial difficulties barred the way. As that aspect of the situation as a whole will be taken up a little farther along, it is only necessary at this point to say that the government began the operation of the National Transcontinental in a tentative way in 1913. It has continued to do so. For the year 1917 the gross earnings were \$7,113,246, which fell short of meeting operating expenses, from which it is obvious the loss to the dominion treasury on interest account and deficits has been relatively large. This taking over of the National Transcontinental was the first long stride toward the creation of the largest railway system on this continent. Up to this time no effort has been made to throw all the mileage acquired into a single railway with both central control and centralized administration. Ownership and operation are both in government hands; but not under a common name nor a single central management. But I must not get ahead of the chronological order of events.

A year after the outbreak of war the financial difficulties of the Grand Trunk Pacific and the Canadian Northern reached an acute stage. The former had its parent, the Grand Trunk, to fall back upon, although government was joint guarantor of its bonds; but the latter stood alone. A royal commission was appointed in 1916 to consider "in a comprehensive way the conditions and necessities of railway development in Canada," and the famous Drayton-Acworth report* was the immediate result. It is unnecessary for the purposes of this sketch of events to repeat any of the details of that significant finding. The taking over by government of the Grand Trunk, the Grand Trunk Pacific and the Canadian Northern was recommended. The setting up of a huge state system was held to be both unavoidable and expedient. Government had just given \$60,000,000 to the Canadian Northern and \$8,000,000 to the Grand Trunk Pacific to meet immediate and urgent needs. Thus far possession of only the Canadian Northern has been assumed. Bearing in mind that up to 1903 government had owned and operated only 1,788 miles of line, which represented no material change as against the early days of confederation, it is well to see what was the position of matters in 1918. This is the situation today:

GOVERNMENT MILEAGE

Intercolonial	1,518
Prince Edward Island.....	275
National Transcontinental	1,810
Canadian Northern	9,405
Branch lines acquired.....	524
Total.....	13,532

Here was a big change. By a few swift strokes the government had altered the entire railway map of Canada. In doing so it had increased its capital liabilities on railway account from \$120,000,000 in 1910 to \$800,000,000 in 1918. If it had carried out the Drayton-Acworth recommendations to the full the final aggregate would not have been less than \$1,250,000,000 on 18,876 miles of lines. Of course, this has meant no more than a transfer of responsibility from corporate to public shoulders; but that does not modify the significance of the movement as a vital change in the Canadian railway situation.

*Railway Age Gazette, May 4, 1917, pages 953 and 957.

The Public Attitude

As this is intended to be a mere statement of facts, free from the expression of personal opinion or comment, it is necessary to answer certain questions which must obviously arise in the minds of those who read. The public attitude, for example, is immediately suggested. The process by which such revolutionary changes were brought about may be expected to have its place in a frank history of events. The suspicion is unavoidable that all this must have been preceded by elaborate discussions in Parliament, in the press and on public platforms, of the underlying principle. Let it therefore be said at once that public judgment on these vast changes has neither been specifically sought nor positively declared. The matter in any of its aspects has not been an issue before the people. What has been done by the government has been the result of what was believed to be irresistible necessity. The National Transcontinental was built by the government and, although intended to be handed over to the Grand Trunk Pacific, was never taken off its hands. By reason of guarantees of bonds by the provinces and the Dominion, the taking over of the Canadian Northern was practically compulsory. The owners were at the end of their tether under war conditions, and the chief guarantors saw no avenue of escape from assuming a liability which already lay at their door. The definite grasping of these facts is essential to an understanding of the otherwise surprising statement that the Canadian public has to a large extent been both passive and silent. At all events, one would search the records of Parliament and the newspapers in vain to find anything which could be fairly recognized as a general discussion of the policy of government ownership as against the policy of corporate ownership. Nor has the government itself made any clear-cut announcement on the question.

Looking ahead, it might fairly be asked whether or not the government intends to give effect to the recommendations of the Drayton-Acworth report as respects the Grand Trunk and the Grand Trunk Pacific. I do not know, and it would be improper and impolitic to surmise. Nobody knows. The Grand Trunk in 1917 had net earnings of \$13,179,039, and showed a surplus of \$1,962,995 after meeting all its fixed charges. This is to be viewed, however, in the light of its obligations on account of the Grand Trunk Pacific. It is the guarantor of large responsibilities incurred by that road. The Grand Trunk Pacific itself had a shortage of \$205,000 as between gross earnings and operating expenses in 1917, to which should be added fully \$7,000,000 on account of fixed charges. The situation in this regard has not been materially changed since 1916, and at the end of that year Sir Henry Drayton and W. M. Acworth reported to the government as follows: "We estimate the present annual liability of the Grand Trunk in connection with the Grand Trunk Pacific system to be considerably over \$5,000,000 per annum, and after January, 1923, it will increase to over \$7,000,000. * * * We recommend that the control both of the Grand Trunk Pacific and of the Grand Trunk be assumed by the people of Canada." A. H. Smith, in his minority report, recommended that the operation of the Grand Trunk Pacific be transferred to the Canadian Northern, which would admit of a considerable reduction in mileage; but, since the latter road has been definitely taken over by the government, it will be seen that this suggestion is now out of the question.

Neither the war nor the burdens arising therefrom can very well have any direct effect on the situation as presented in the foregoing paragraphs. What has been done was held to be unavoidable. It was regarded as the most prudent and promising way of meeting a liability which already lay at the door of the government by reason of the public guarantees outstanding. In other words, the choice exercised was believed to be the best for the defense of the dominion treasury. Whether or not the same force, proceeding from precisely

similar impulses, will lead to the early absorption of the Grand Trunk Pacific is a question which would seem to demand an early answer; but what that answer will be rests with the judgment of those who govern.

Inevitably, the aggressions of the government led to more or less general and sporadic talk, in the press and among men, on the comprehensive topic of nationalization. Having gone so far, it became a question for debate whether or not it would be both logical and expedient to go further—to the point of throwing all the railways of Canada into a common pool. There were factors on the surface which gave a suggestion of strength to such a bold scheme. The net earnings of all lines produced a balance on the credit side; while any combination which excluded the Canadian Pacific was more or less weak. Nevertheless, both the Drayton-Acworth report and the Smith report strongly urged the leaving of the Canadian Pacific alone. This created an obstacle. In so far as there was any discussion at all, either academic or constructive, it had its foundation very largely, if not wholly, in the situation created by the distressing finances of the Canadian Northern and the Grand Trunk Pacific. Probably some positiveness might have been given to these arguments, outside of the propaganda at Kitchener, Ont., but for the interest centered in the war. Be that as it may, the point I am trying to make is that nothing has happened in a definite way to show the trend of public judgment either for or against state ownership. The action of government was based on monetary considerations rather than an avowed principle, and there the whole matter rests at the present time.

New Rates a Relief

Meanwhile, it may be said that the railways of Canada have had strong reasons for welcoming the relief which the new scale of rates has given them. That scale became effective on August 12, last, and, while it has given a fillip to gross earnings, it is much too early to speculate on the possible effect on net earnings. Much has happened to suggest that the additional inflow will be balanced by the additional outflow, for it is already clear that the McAdoo award to employees, plus the rising cost of supplies, has greatly added to operating expenses. It should be understood that the McAdoo ruling as to rates of wages found almost instant acceptance in Canada, and was a striking demonstration of the sympathetic relationship which prevails between the two countries as respects railways. On the other hand, there is just the shadow of a hope that the final balance for the fiscal year may be favorable; for the one outstanding benefit of the war, over against all the trials which it brought, was the development of efficiency in the operating departments. The movement of a greatly swollen volume of traffic in 1916 and 1917 had to be carried out with less equipment than was available in 1914 and 1915. Not only was there an actual decrease in the number of rolling stock units, but the loss of skilled labor from the shops made repairs slow and unsatisfactory. The introduction of female help was valuable, but it scarcely restored the conditions which existed prior to wholesale enlistments in the Canadian army. The operating officers made a virtue of necessity, however, and strove by every means to increase the average carload, train-load and so on. They were like the cheerful old liar who, when asked to explain how his dog had managed to climb a tree to escape from a pursuing bear, said: "He had to, the bar was crowdin' him so." In these heroic efforts to accomplish the seemingly impossible they had great assistance from the Railway War Board, whose work it was my pleasure to record a few months ago.

The collapse of the Germans and the ending of the war has brought the railways of Canada, in common with those of other countries, sharply up against the problems of peace.

It would be premature to make predictions. Nothing has yet happened to indicate the probable trend of events.

The nightmare of a possible reaction and great upheavals in trade is scarcely driven away by the hope that adjustments will swiftly take place; for the relationship between commerce and traffic is so intimate that the ups and downs of one always mean the rising or falling of the other.

The remembrance of what occurred in 1914 and the early part of 1915, when the paralyzing blow of war struck the railways, is a vivid part of the contemplations of peace. Nor can responsible officers find any comfort in the uncertain and unexpressed attitude of public or official judgment as to what may be done in the vital matter of nationalization, as to which I am as much in the dark as are they.

Receiverships and Foreclosure Sales in 1918

The Government by Taking Over the Roads Suspended the Natural Economic Laws of Railroad Bankruptcy

SINCE THE LAW taking over the railroads specifically provides that without the permission of the director general of railroads the property of a railroad company used in transportation service shall not be attached by the courts, the receiverships established in 1918 were few and unim-

portant with the exception of the Denver & Rio Grande. In the case of that road the order of the court appointing a receiver was so worded as to put the question of whether or not a receiver should take charge of the property up to the director general of railroads. The other six roads are unim-

RAILROADS IN THE HANDS OF RECEIVERS

Name of road	Mileage	Date of receivership	Bonds of old company	Stock of old company	Total old company securities
Artesian Belt	46	April 25, 1917	.....	\$70,000	\$70,000
Birmingham, Columbus & St. Andrews	38	Dec. 24, 1908	\$250,000	4,500,000	4,750,000
Boston & Maine	2,298	Aug. 29, 1916	43,338,000	42,655,191	85,993,191
Connecticut River	88	Aug. 31, 1916	2,260,250	3,233,300	5,493,550
Vermont Valley	25	Aug. 31, 1916	3,800,000	1,000,000	4,800,000
Boyer City, Gaylord & Alpena	94	Nov. 19, 1913	800,000	669,300	1,469,300
Cape Girardeau Northern	104	April 14, 1914	1,500,000	110,000	1,610,000
Chicago & Eastern Illinois	1,136	May 27, 1913	59,289,000	18,267,900	77,556,900
Chicago, Peoria & St. Louis	255	July 31, 1914	4,000,000	4,000,000	8,000,000
Colorado Midland	338	July, 1918	9,532,000	10,000,000	19,532,000
Creston, Winterset & Des Moines	22	June 25, 1914	200,000	98,600	298,600
Dansville & Mt. Morris	15	June, 1894	150,000	50,000	200,000
Denver & Rio Grande	2,610	Jan. 26, 1918	121,802,000	87,779,800	209,581,800
Denver & Salt Lake	255	Aug. 16, 1917	12,514,000	12,182,500	24,696,500
Elkin & Allegheny	15	Dec. 13, 1915	480,000	476,300	956,300
Evansville & Indianapolis	146	May 27, 1913	2,500,000	2,000,000	4,500,000
Fellsmere Railroad	16	Jan. 5, 1917	.....	.....	.....
Florida, Alabama & Gulf	26	Feb. 27, 1914	500,000	150,000	650,000
Fort Smith & Western	254	Oct. 9, 1915	6,240,000	5,000,000	11,240,000
Fort Smith, Subiaco & Eastern	14	Feb., 1918	400,000	150,000	550,000
Georgia & Florida	348	Mar. 27, 1915	7,820,000	8,750,000	16,570,000
Georgia Coast & Piedmont	100	July 14, 1916	1,807,287	1,572,000	3,379,287
Gould Southwestern	18	April 14, 1914	8,929	51,000	59,929
Greenville & Western	23	Aug. 29, 1917	460,000	50,000	510,000
Greenville Northwestern*	12	Dec. 1915	.....	.....	.....
Gulf, Florida & Alabama	157	May 9, 1917	4,410,000	4,410,000	8,820,000
Haynesville & Montgomery	9	Mar. 1, 1917	41,000	50,000	91,000
Houston & Brazos Valley	29	Nov. 27, 1915	420,000	24,000	444,000
Illinois Southern	140	Sept. 18, 1918	3,398,000	5,000,000	8,398,000
International & Great Northern	1,160	Aug. 11, 1914	26,347,000	4,822,000	31,169,000
Kansas City, Mexico & Orient	964	April 17, 1917	31,000,000	20,000,000	51,000,000
Kansas City Northwestern	200	Feb., 1917	.....	.....	.....
Kansas City, Ozark & Southern	15	Dec. 23, 1914	.....	.....	.....
Liberty-White	50	Nov. 12, 1914	4,050	300,000	304,050
Louisiana & North West	121	Aug. 23, 1913	2,250,000	2,300,000	4,550,000
Macon & Birmingham	97	Feb. 1, 1908	500,000	500,000	1,000,000
Manitowish & North Eastern	190	Dec., 1918	1,172,000	1,172,000	2,344,000
Marshall & East Texas	72	Jan. 25, 1917	1,180,000	200,000	1,380,000
Michigan East & West	72	Jan., 1918	.....	200,000	200,000
Missouri & North Arkansas	365	April 1, 1912	8,353,295	8,340,000	16,693,295
Missouri, Kansas & Texas	1,744	Sept. 27, 1915	101,728,750	76,283,257	178,012,007
Missouri, Kansas & Texas of Texas	1,792	Sept. 27, 1915	35,638,054	10,152,500	45,790,554
Nevada Short Line	12	Jan., 1916	.....	.....	.....
Ocala Southern	110	July 12, 1918	416,000	265,000	681,000
Orangeburg Railway	17	June 17, 1916	.....	100,000	100,000
Palatine, Lake Zurich & Wauconda	15	Oct. 19, 1914	.....	230,000	230,000
Pine Bluff & Northern	10	Feb. 9, 1916	43,000	160,000	203,000
Pittsburg, Shawmut & Northern	205	Aug. 1, 1905	14,655,000	15,000,000	29,655,000
Richmond & Rappahannock*	26	Oct. 25, 1917	458,000	500,000	958,000
Rome & Northern	28	Feb. 28, 1911	.....	1,000,000	1,000,000
St. Louis & Missouri Southern	8	April 13, 1915	.....	.....	.....
St. Louis, El Reno & Western	42	Oct. 9, 1915	817,000	970,800	1,787,800
Salina Northern	81	July 27, 1917	1,500,000	1,162,300	2,662,300
San Antonio, Uvalde & Gulf	317	Aug., 1914	4,413,000	280,000	4,693,000
Sharpville	18	Jan. 20, 1897	68,779	350,000	418,779
Southwestern Railway	30	Nov. 11, 1917	354,000	35,000	389,000
Tennessee & North Carolina	37	Sept. 13, 1916	454,000	306,100	760,100
Tennessee Central	295	Dec. 31, 1912	12,232,900	7,941,450	20,174,350
Texas & Pacific	1,947	Oct. 27, 1916	54,621,000	38,763,810	93,384,810
Tidewater & Western	93	May 14, 1917	300,000	300,000	600,000
Toledo, Peoria & Western	248	July 2, 1917	4,895,000	4,076,900	8,971,900
Toledo, St. Louis & Western	454	Oct. 22, 1914	27,602,000	19,947,600	47,549,600
Trinity & Brazos Valley	369	June 16, 1914	8,760,000	304,000	9,064,000
Wabash, Chester & Western	65	July 15, 1914	690,000	1,250,000	1,940,000
Waupaca Green Bay	3	Aug., 1917	75,000	1,400	76,400
Waycross & Western	45	Aug., 1918	384,000	420,000	804,000
Wichita Falls & Northwestern	329	June, 1917	.....	2,000,000	2,000,000
Williamsport & North Branch	56	Jan. 8, 1917	545,000	1,324,662	1,869,662
Totals	20,333	.....	629,377,294	433,258,070	1,062,635,364

* Discontinued.

† 20 miles of this road were sold at foreclosure, leaving 72 miles in hands of receivers.

‡ This property was sold at foreclosure in 1918, but it is still in the hands of receivers.

portant and form no part of the main line railroad mileage of the United States. The director general ruled that the receivership extended only to the free assets of the Denver & Rio Grande Railroad Company and did not pertain to the railroad itself. The receiver, therefore, took charge only of the free assets of the company not used in the transportation business and a federal manager was appointed for the Denver & Rio Grande in the same way as for a solvent company. It would seem proper, however, to include the mileage of the Denver & Rio Grande in our annual table since the company itself is bankrupt and the company owns the mileage shown in our table although temporarily a receiver is not in charge of this mileage.

The Colorado Midland not only went into the hands of a receiver but as mentioned elsewhere in the article on

RECEIVERSHIPS ESTABLISHED IN 1918

Name of company	Mileage	Funded debt outstanding	Stock outstanding
Colorado Midland	338	\$9,532,000	\$10,000,000
Denver & Rio Grande	2,610	121,802,000	87,779,800
Fort Smith, Subiaco & Eastern	14	400,000	150,000
Illinois Southern	140	3,398,000	5,000,000
Manistee & North Eastern	190	1,172,000	1,172,000
Michigan East & West	72	.....	200,000
Ocala Southern	110	416,000	265,000
Waycross & Western	45	384,000	420,000
Totals	3,519	\$137,104,000	\$104,986,800

abandoned lines, a considerable part of it was actually abandoned and is to be torn up.

While there is nothing in the law taking over the railroads which specifically forbids a reorganization of a railroad property in bankruptcy there were no important foreclosure sales during the year. Even if a bankrupt company were to be reorganized the railroad which it owned could not be taken away from the federal manager. The short lines shown in our table are those that were sold under foreclosure but were not taken over by the government.

Of the roads still in the hands of receivers, the Missouri, Kansas & Texas, the Texas & Pacific, the Boston & Maine,

FORECLOSURE SALES IN 1918*

Name of company	Mileage	Funded debt outstanding	Stock outstanding
Alabama, Tennessee & Northern	195	\$4,436,087	\$7,350,000
Cincinnati, Findlay & Fort Wayne	93	1,150,000	1,250,000
Kansas City & Memphis	56	862,000	840,000
Leavenworth & Topeka	57	250,000	50,000
Marshall & East Texas†	20	.....	.....
Michigan East & West	72	.....	200,000
New Mexico Central	116	.....	2,500,000
Ozark Valley	45	150,000	50,000
Stockton Terminal & Eastern	19	84,400	263,900
Tennessee Railway	61	1,129,000	1,000,000
Watauga & Yadkin River	29	.....	3,169,800
Totals	763	\$8,061,487	\$16,673,700

* The receivership of the Pacific & Idaho Northern was ended June 21, 1918, without foreclosure proceedings.

† See large receivership table.

and the Toledo, St. Louis & Western are the most important.

A plan has been worked out for the reorganization of the Boston & Maine under which plan, published in the *Railway Age* of September 20, page 537, holders of guaranteed stock of leased lines are to accept stock in the new company which is to be formed. The fact that James H. Hustis, the receiver, had the confidence of the Railroad Administration as well as the various interests involved in the Boston & Maine reorganization aided materially in the working out of a sound plan of reorganization. Furthermore, since the plan needed the approval of the Railroad Administration before it could become effective this gave a leverage to bring all interests together that would otherwise have been lacking.

It must be remembered that not only in the Denver & Rio Grande case, but in the case of all the larger roads shown in our table of roads now in the hands of receivers the road itself

is being operated by a federal manager appointed by the director general and not by the receiver.

Had it not been for the government's taking over the roads and had no relief been afforded in the way of increased rates,

SUMMARY OF FORECLOSURE SALES IN 43 YEARS

Year	No. of roads	Miles	Bonds and stocks
1876	30	3,840	\$217,848,000
1877	54	3,875	198,984,000
1878	48	3,906	311,631,000
1879	65	4,909	243,288,000
1880	31	3,775	263,882,000
1881	29	2,617	137,923,000
1882	16	867	65,426,000
1883	18	1,354	47,100,000
1884	15	710	23,504,000
1885	22	3,156	278,394,000
1886	45	7,687	374,109,000
1887	31	5,478	328,181,000
1888	19	1,596	64,555,000
1889	25	2,930	137,815,000
1890	29	3,825	182,495,000
1891	21	3,223	169,069,000
1892	28	1,922	95,898,000
1893	25	1,613	79,924,000
1894	42	5,643	318,999,000
1895	52	12,831	761,791,000
1896	58	13,730	1,150,377,000
1897	42	6,675	517,680,000
1898	47	6,054	252,910,000
1899	32	4,294	267,534,000
1900	24	3,477	190,374,000
1901	17	1,139	85,808,000
1902	20	693	39,788,000
1903	13	555	15,885,000
1904	13	524	28,266,000
1905	6	679	20,307,000
1906	8	262	10,400,000
1907	6	114	13,777,000
1908	3	138	2,547,000
1909	12	2,629	250,033,000
1910	17	1,100	93,660,109
1911	13	1,386	40,741,453
1912	12	661	25,910,990
1913	9	1,159	86,163,850
1914	6	1,470	83,189,500
1915	11	3,914	285,258,782
1916	26	8,355	703,444,855
1917	20	10,963	557,846,348
1918	11	763	24,735,187

it is quite possible that instead of being one of the shortest lists of railroad receiverships that has ever been published in the *Railway Age* the list this year would have been the greatest in the history of American railroads.

SUMMARY OF RECEIVERSHIPS FOR 43 YEARS

Year	No. of roads	Miles	Bonds and stocks
1876	42	6,662	\$467,000,000
1877	38	3,637	220,294,000
1878	27	2,320	92,385,000
1879	12	1,102	39,367,000
1880	13	885	140,265,000
1881	5	110	3,742,000
1882	12	912	39,074,000
1883	11	1,990	108,470,000
1884	37	11,038	714,755,000
1885	44	8,836	385,460,000
1886	13	1,799	70,346,000
1887	9	1,046	90,318,000
1888	22	3,270	186,814,000
1889	22	3,803	99,664,000
1890	26	2,963	105,007,000
1891	26	2,159	84,479,000
1892	36	10,508	357,692,000
1893	74	29,340	1,781,046,000
1894	38	7,025	395,791,000
1895	31	4,089	369,075,000
1896	34	5,441	275,597,000
1897	18	1,537	92,909,000
1898	18	2,069	138,701,000
1899	10	1,019	52,285,000
1900	16	1,165	78,234,000
1901	4	73	1,627,000
1902	5	278	5,835,000
1903	9	229	18,823,000
1904	8	744	36,069,000
1905	10	3,593	176,321,000
1906	6	204	55,042,000
1907	7	317	13,585,000
1908	24	8,009	596,359,000
1909	5	859	78,095,000
1910	7	735	51,427,500
1911	5	2,606	210,606,882
1912	13	3,784	182,112,497
1913	17	9,020	477,780,820
1914	22	4,222	199,571,446
1915	12	20,143	1,070,808,628
1916	9	4,439	208,159,689
1917	19	2,486	61,169,962
1918	8	3,519	242,090,800

Progress Report on the Valuation Work

War Has Seriously Interfered With It, Both Retarding the Work and Increasing Its Cost

By Charles A. Prouty

Director, Division of Valuation, Interstate Commerce Commission

THE WAR HAS SERIOUSLY interfered with the progress of our valuation work, having both retarded the work itself and increased its cost. The effect has been somewhat different upon different sections of that work.

Engineering Section.—The majority of our engineers were within the draft age, and many of them were included in the draft. An active demand for various kinds of engineering service was created by the war. All this made it difficult to obtain and retain competent engineers. It frequently happened that 25 per cent of our engineering force was changed in a single month. Since experience is of the essence of things in our work, this very much reduced the efficiency of our force and interfered with our progress.

Four years ago I estimated that our field work should be finished as of an average date, January 1, 1920. But for the war we should have been six months ahead of that program. As it is we are just about along with it. In the Southern and Pacific districts we have already disbanded several of our road and track parties and shall finish before the end of the year, even with our reduced force. In the Western district we shall complete our road and track work somewhat before January 1, while our structural and mechanical work will extend over into the following year. In the Central and Eastern districts our field work in all branches will extend slightly beyond January 1. On the whole, our field work will be completed just about as of an average date January 1, 1920, as predicted.

The effect in the engineering section has been more serious in the office than in the field for various reasons which need not be referred to. It had been estimated that our office work would be cleaned up in from a year to a year and six months after the completion of our field work. Owing to the delays of the war that estimate must be increased by about one year.

It is now estimated that engineering reports will be filed in Washington, upon all properties, in about three years from January 1 next. Here, again, we shall be somewhat ahead in some districts and somewhat behind in others.

Accounting Section.—The effect of the war during its continuance was perhaps more serious upon our accounting work than anywhere else. The number of accountants actually taken into military service was not great, but the activities of the war, both on the part of the government and in private enterprise, seemed to call for a great amount of accounting effort which very much increased the demand for accountants as well as the compensation paid. It was especially difficult to find accountants at the salaries which the commission

could offer who were competent to make reports. With the close of hostilities this difficulty is fast passing away and it is apprehended that we shall find it easily possible to conclude our accounting work within the time above indicated for the completion of engineering reports.

Land Section.—Most of our land appraisers were beyond the draft age and the war did not materially interfere with the prosecution of this branch of our work. While only about 150,000 miles of railway have actually been covered by our land appraisers in the field up to the present time, there will be no difficulty in bringing the work of that section to a completion along with that of our accountants and engineers.

In a word, we expect to complete our field work for the most part next year, and to finish the entire work within the two following years. This brings the valuation work to the point where reports of all sections upon all properties are filed with the commission in Washington. No estimate has ever yet been made as to the time which may be required to adjust the objections which carriers will make to these reports, but it is believed that after a little this will go forward rapidly.

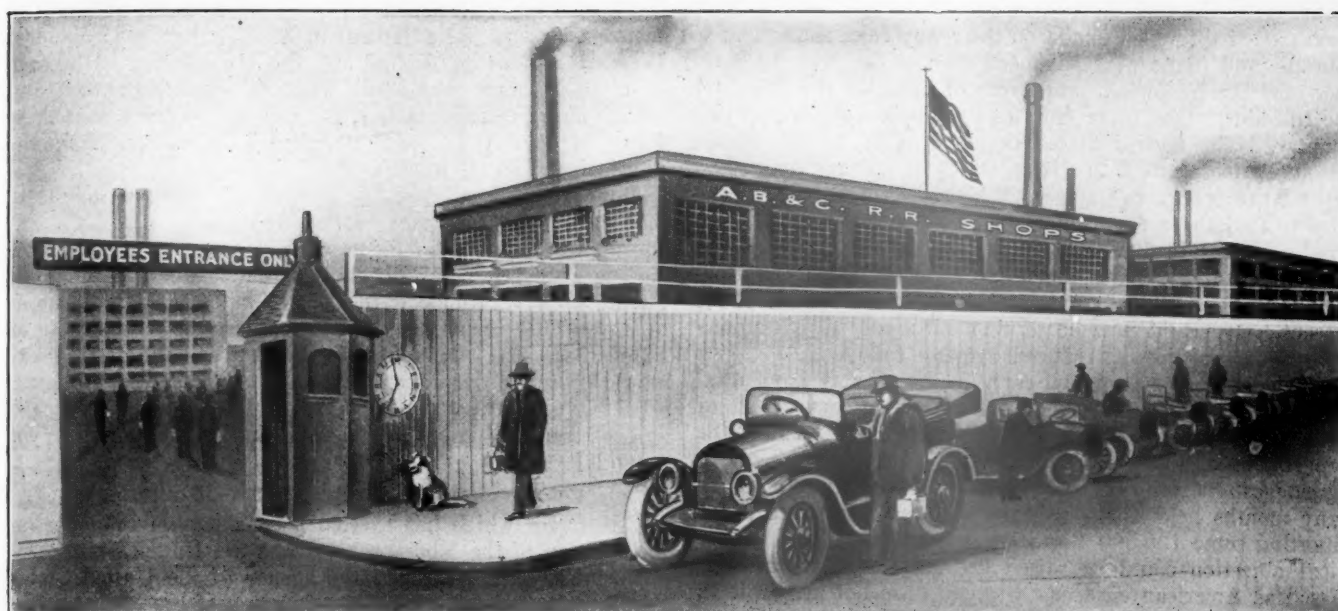


C. A. Prouty



From the New York Tribune

And All He Asked for Was a Sword and a Gun



A Year of Prosperity for Railway Labor

Federal Control and Industrial and Military Activity Have
Introduced Marked Innovations in Past Practices

WITH THE SIGNING of the armistice on November 11 the word *finis* was placed on many formidable tasks which had been imposed on industry and commerce of this country. Of these, none has given greater concern than that of maintaining an adequate supply of labor. We still have today a labor problem of no mean proportions, but it is essentially different than that of the war period, although many of the perplexing difficulties yet to be overcome are in a sense an inheritance of the departing year. However, the indications are that the great problem of labor shortage will soon be no more, and it is now possible to review the trying times of the last twelve months as a book in which the last chapter has been written.

Three and a half years of war in Europe previous to our entrance into the conflict virtually stopped immigration, which for years was our chief source of common labor; the enormous growth of war industries created an unprecedented demand for men, and finally our own participation in the war led to the withdrawal of several million men for military duty and employment in government construction projects. So while there came to be an enormous shortage of help of all kinds, it was most severe in lines of industry or commerce requiring common labor, machinists and young men of military age. The railroads suffered in all branches of the service, but primarily in those employing men of the classes enumerated above. The problems of the various departments of railway service were essentially different and for that reason they are treated separately in this article. Nevertheless the underlying causes of difficulty were inter-related, and a number of influences were brought to bear which affected all departments to a greater or lesser extent. Federal interference, the wage advances, the attitude of the Railroad Administration toward organized labor, the employment of women, the activities of the Federal immigration bureau, all constitute interesting phases of the trying times from which we are just emerging and indicate the nature of the many and diversified factors which will play an important part in the

ultimate outcome of the no less difficult period into which we have but recently entered.

Going back to the first days of the past year, the plight of the railroads was indeed serious. The armed forces of the nation had already claimed about 70,000 men, the war industries had taken many more, and these factors had perfected their instrumentalities for recruiting and inducting additional forces at a rapid rate, with the further advantage over the railroads in the form of a much greater attractiveness of the service—the army and navy—through an appeal to patriotism and the industries through much higher wages. In addition, the draft was already removing certain classes of men.

Immigration, which has been the source of such a large proportion of track forces, had become a minus quantity, for whereas the average number of aliens entering this country annually during the years 1905 to 1914, inclusive, was 1,012,000, this number has since never exceeded 300,000, and was more than neutralized in later years by an even greater emigration. A further disquieting influence was that arising from an appreciation of the labor shortage by the men themselves, resulting in a marked spirit of unrest, characterized by unreasonable demands for increased wages and improved working conditions, and a marked tendency to jump from job to job in an effort to seek the Utopian position affording maximum pay and minimum work.

Efforts to overcome problems confronting all employers of labor in this country followed several diverting channels, which were actuated by a number of independent activities. Some of these were fruitful of excellent results, some were not. They may be classified as follows: The development of additional sources of supply, improved wage and employment conditions, the unification of labor solicitation tending to eliminate competition, and efforts to increase production.

Immigration

Considerable speculation naturally occurred in regard to increasing the supply of labor from the outside, an idea

fathered by the fact that thousands of Asiatic workers have been passed through Canada on their way from the Orient to Europe, and plans were advanced even as early as the summer of 1917 by certain employers of labor in the West for the introduction of these Asiatics as temporary labor in this country. The United States Department of Labor refused absolutely to entertain this idea, which at no time progressed beyond the speculative stage. Whether it would have been wise to undertake this project in view of the political gunpowder it contained, is a question, but the fact remains that if a large number of these men had been employed here during the past year their removal from the labor market at the present time would now be serving effectively as a counterbalance for the present reduced demand for men.

Mexico was also suggested early in the year as a potential source of supply, but the operation of the literacy clause of the new immigration law served to exclude the peon. The Department of Labor for a long time turned a deaf ear to any suggestions for assistance even from this source, and for many months held up as a glittering possibility a plan for importing some 100,000 Porto Ricans, against whom no political objection could be raised because they were already classed as American citizens. Statistics are not available to show how many of these men actually reached this country, but they did not become an important factor in the solution of the labor difficulty.

Action was finally taken on the Mexican situation on June 20, when Secretary of Labor Wilson issued a department order temporarily removing the restrictions as to head tax, illiteracy and contract labor for Mexicans who would come to this country temporarily for work on farms, in mines or on railroads. However, the conditions imposed on the Mexican in waiving these restrictions were so severe as to offer little inducement for him to enter. Among other things his employer was required to withhold and deposit with the government 25 cents for each day of his sojourn in this country. Since this plan for obtaining immigrants proved impotent under these provisions they were finally removed in August, too late in the year to be of much avail.

That enlistments and the effect of the selective draft had made considerable inroads on the railroads is indicated by the fact that over 200,000 railway employees joined the colors. The Railroad Administration requested the War Department to grant relief from the operation of the draft law, in the form of instructions to the local draft boards to give deferred classifications to essential railway employees. This was not done, but following the passage of the second draft law calling for the registration of all male citizens between the ages of 18 and 45 inclusive who were not registered previously, instructions were issued to the railroads to request all essential employees to present industrial exemption claims when filling out questionnaires. This, however, came too late in the war to be of any effect.

The Employment of Women

Another effort toward increasing the supply of labor was directed toward the employment of women to a larger extent in pursuits in which they had been used in the past, and also as substitutes for men in classes of work formerly done by men only. That these efforts have been accompanied by no little success is evidenced by an increase in the number of women employed from 60,000 in January, 1918, to about 100,000 in October. Of 81,000 employed on July 1, 61,000 were engaged in clerical work, at which they replaced many men and served greatly to relieve the situation in the clerical departments. The remaining 20,000 were employed in shops, scrap yards, coach yards, storehouses, etc. Some were also used on track work but as compared to the total number engaged the proportion in this work was small. Various obstacles were presented to their use for such work, among which were the need of better facilities for their com-

fort and their inability to do the heavier work. Finally in October, orders were issued in the Eastern and Central Western regions to discontinue the employment of women as track laborers, warehouse truckers, night watchmen and callers at train headquarters, the conclusion being that these forms of employment were unsuited to them both from the physical and social standpoints.

Boys have been used in increasing numbers in shops, offices, and on the track, following various plans for encouraging them to enter the service during summer vacations. College students, many of whom found railroad employment during their vacations, were also used in considerable numbers, but enlistments measurably reduced the possibilities of relief from that source during 1918. One interesting example of what was accomplished along this line, however, was the use of a special gang of University of Chicago students on track work on lines of the Burlington in Wyoming.

The Federal Employment Service

One factor which has exerted a considerable influence on the solution of the labor problem was the United States Department of Labor through the agency of the United States Employment Service. This is a function of the labor bureau that had been designated originally to help immigrants find work, but which had gradually been expanded so that at the beginning of the year there were 100 branches or employment offices in operation throughout the United States. Special impetus given to this department of the labor bureau during 1918 led to its rapid expansion so that there were some 600 government labor agencies in operation by midsummer.

In accordance with the policy pursued by the government for centralized control of many national activities suffering from inadequacy because of the war, the employment service undertook to centralize the employment and distribution of labor. On June 17, President Wilson issued a proclamation approving this plan and urging all employers engaged in war work to refrain from recruiting unskilled labor in any manner except through the government agencies. The plan provided that after August 1, all industries employing more than 100 men would be required to employ common labor exclusively through this service. Theoretically this was excellent. The competition for labor was keen. Various industries and localities were bidding against each other for the few men unemployed with the result that wages offered by the more profitable enterprises were assuming most unreasonable figures, while men were being shipped back and forth across the country from one labor center to another. To introduce order into this chaotic situation and supply men where most needed, a plan was introduced to take men from non-essential pursuits, thus giving the laborer one central agency for employment of all kinds. This was unquestionably an excellent plan, providing it could be carried out without any deceleration in the recruiting of labor during the transition period.

Skepticism as to the success of this plan was expressed early in the program by employers of common labor, including railroad men, because the first step announced by the federal service in the execution of its plan was to close all existing agencies or place them directly under government control through a formality known as "federalizing." It also became the policy of the service at once to frown upon the fee agency for the obvious reason that in the face of a most profound shortage of labor there could be no excuse for making a man pay for the privilege of getting a job.

The execution of the plan, however, was not as drastic as originally proposed as indicated by the orders issued by the Railroad Administration requiring the roads to comply with the wishes of the employment service. The private agencies were placed under government control, as were the agencies

of the individual railroads, but the roads were permitted to continue the solicitation of labor along their lines and at points where there were no agencies.

Matters did not move very smoothly, although there is a difference of opinion as to the reasons for the difficulties. Officers of the employment service hold that they did not receive the complete co-operation of the railroads, while the railroad officers, on the other hand, infer that the employment service was not organized to handle unskilled labor of the kind commonly employed by railroads. One suggested shortcoming was a lack of adequate supervision to insure that the man actually did ship out after he had been registered or assigned to a given job. Chief among the objections, especially in the early days of federal labor supervision, was that the employment service attendants usually lost interest in the railroad officer's request for men as soon as he stated the rate he was authorized to pay for his help, presumably because the recruiting of men for munition plants at much higher rates proved more congenial. Another source of difficulty was the inability of the employment service to control the activities of some of the great war industries in their strenuous campaigns for help.

Repeated reports of these difficulties to regional officers finally led to regional instructions to the effect that applications for men at the government agencies did not relieve the individual railroad officer from responsibility for the maintenance of an adequate force to conduct the work under his direction. This naturally led to a greater exercise of individual initiative in the procuring of men. Some railroads opened their own agencies in the labor centers, and although most of these were "federalized," a few were said to have made more or less use of the old private agencies. The federal service, however, has continued to be a potent factor in the recruiting of men and is still being called on to supply men for railroad work.

Compensation

Adequate compensation for employees was one of the earliest subjects considered by the Railroad Administration. On January 4, the director general conferred with the officers of four railway brotherhoods with regard to demands made on the railroads before they were taken over by the government. As a result of this conference the director general announced a plan for the appointment of a committee to investigate the entire subject of wages and a committee thus appointed a short time later, consisting of Franklin K. Lane, secretary of the interior; C. P. McChord, member of the Interstate Commerce Commission; J. Harry Covington, chief justice of the Supreme Court of the District of Columbia; and William R. Willcox, of New York, held its first meeting on January 21. Other meetings followed almost daily for the purpose of hearing depositions representing all classes of railway employees until about March 1, when the committee commenced the preparation of its report which was made public in May. Under the provisions of this report all classes of employees were treated alike under a plan founded on two fundamental principles, (1) that the purpose of a wage advance was to afford the employee relief from the heavy increases in the cost of living since the first year of the European war, and (2), that the burden of this increased cost of living fell heaviest on the man with the smallest earnings. Accordingly it was recommended that an advance be granted the employees on a sliding scale of percentages, figured on the rates of pay in effect in December, 1915, these percentages ranging from a maximum of 43 per cent for the man receiving \$46 or less a month to nothing for the person receiving \$250 per month or more.

The recommendations of this report were made effective on May 25, by an order of the director general known as Order No. 27. This embodied two modifications of the original report tending to correct the inadequacy of its pro-

visions with respect to common laborers and shopmen, since the percentage of increase provided for in the report, over the wages in effect on December, 1915, were entirely inadequate to compete with the rates being paid these classes of employees by other industries. Accordingly the shop trades were awarded a minimum hourly rate of 55 cents, while laborers were given a minimum of 2½ cents per hour more than the rates in effect on December 31, 1917.

One of the effects of applying these advances by percentages over rates in effect December, 1915, was that the employee lost all advantage of any advances received in the intervening two years, unless there had been a clearly defined change of position. There was, however, one exception to this. Train service employees who had profited by the basic eight-hour day legislation of 1917, obtained advances clearly over and above the additional compensation resulting from the eight-hour day, since the order provided that the rates of increase in their pay should be determined from the average monthly compensation for the fiscal year of 1915 for each class of service, and that these percentages should then be applied to the mileage rates in existence at that time.

The wage award of Order No. 27, however, proved unsatisfactory to nearly all classes of employees and pleas for relief to the Railroad Board of Wages and Working Conditions, created by one clause of Order No. 27, were presented by many different groups of men. The hearings of these various complaints led to the promulgation of certain supplements to Order No. 27, providing special awards of wage increases for individual classes of employees. As each of these involved conditions peculiar to the several classes of employment they are treated under separate headings.

Maintenance of Way Employees

In no department of railway service at the beginning of the past year was there as great disparity between the wages paid by the railroads and the outside interests as in the maintenance of way department. Supervisory officers had done their best during 1917 to improve working conditions and housing and feeding facilities, but it became apparent very soon in the spring of 1918 that no matter how great were the advances attained in these conditions it was impossible to hold men if there was an appreciable spread between the wages they were being paid and those which they could get elsewhere. Not only were the men afforded opportunities for doing common labor at considerably higher rates, but many of the brighter and more intelligent of them were being recruited for the semi-skilled trades of the war plants. The bridge and building carpenter forces too, had been subject to enormous inroads for some time because of the activities in cantonment, ship building, and munition works construction.

Government control of the railroads introduced a disturbing factor, since it made the individual roads uncertain as to their authority in granting wage advances to meet the competitive conditions. Although the wage commission was at work within less than a month after Mr. McAdoo assumed control of the railroads, it was confronted with such an enormous task that relief could not be expected in time to be of much benefit for the early days of the working season.

The first action taken on the part of the Administration was an attempt at temporary standardizations of track laborers' wages by the regional directors. Thus the director of the Western region issued an order on March 30, fixing the rate of wages for track laborers in the southwest and western territories at 25 cents and in the northwestern territory at 27½ cents, with the latter rate applying also to all terminals. When Order No. 27 finally appeared on May 25, it was found to be virtually impotent as far as the lower classes of labor were concerned. Consequently orders were issued by regional directors granting additional raises in rates to track forces. Orders were also issued calling atten-

tion to the need of making living and working conditions as attractive as possible.

These measures proved ineffective in keeping up the forces. Inquiries made of railway officers during the month of July indicated that the shortage in the track forces at that time was from 30 to 50 per cent of the estimated number required to complete the season's program. Conditions, however, were found to vary greatly since some roads had nearly the full complement while others had a totally inadequate force.

Hearings by the Board of Wages and Working Conditions on the status of employment in the maintenance of way department finally became the basis for Supplement No. 8 to Order No. 27 issued September 10 and made effective as of September 1. This superseded provisions of Order No. 27 insofar as it applied to the employees covered in the supplement and in place of the percentage increases provided in the order there were introduced specific advances for hourly, weekly and monthly rates of pay according to a carefully prepared classification of employees. For instance, track laborers were advanced 12 cents per hour over the rate in effect on January 1, 1918, with a minimum of 28 cents and a maximum of 40 cents. Track foremen were granted an advance of \$25 per month over the rates of January 1, with a minimum of \$100 a month, while assistant foremen were given 5 cents an hour more than the laborers.

Generally speaking, the provisions of Supplement No. 8 were satisfactory insofar as they concerned most of the laborers and craftsmen, but early interpretations of this supplement indicated that the foremen, especially in the case of bridge and building and water service groups, would in many cases receive less compensation than the men who worked for them. Later interpretations, taking into account the provisions for a basic eight-hour day, under which it was assumed that the new monthly rate was based on an eight-hour working day with provisions for overtime provided a reasonable spread over the compensation to the workmen in most cases.

No mention is made in Supplement No. 8, or any other supplement, of draftsmen or engineering assistants in the maintenance and construction departments, but some interpretations have classified these men either as clerks in Supplement No. 7, or as under a blanket provision of Supplement No. 8, so that in these cases the engineering assistants in the minor positions have been fairly well provided for. Engineers holding positions comparable to those of the lower division officers have not been covered in any way by Supplement No. 8, although most of the division officers have received recognition in the form of a supplemental regional order granting additional compensation. Thus, on August 1, roadmasters received an advance of \$25 per month over the rate in effect on January 1, 1918.

The Mechanical Department

During 1917 the demands of munition plants for skilled mechanics had seriously depleted the ranks of the railroad shop men. At the beginning of 1918 there was a serious shortage of both skilled and unskilled workers. Director General McAdoo's promise to grant adequate wages was quite as effective in holding the men as any actual increase could have been and comparatively few mechanics left the service during the early part of the past year. The employees of the mechanical department were not satisfied with the increases awarded by the provision of General Order No. 27, and the disapproval of the findings of the commission was so strong that strikes took place in two shops. It was evident that the employees had expected to be awarded wages commensurate with those paid to mechanics in war industries. In hearings before the Board of Wages and Working Conditions the representatives of the shopmen's organization asked for a rate of 75 cents an hour. Supplement No. 4 to General Order No. 27 established minimum rates of 68

cents an hour for mechanics, boiler makers, blacksmiths, sheet metal workers, molders and first class electrical workers, 58 cents an hour for carmen and second class electrical workers, and 45 cents an hour for helpers. It provided also for foremen paid on an hourly basis a rate 5 cents higher than their respective craft and an increase of \$40 a month for foremen paid on a monthly basis, with a minimum of \$155 and a maximum of \$250. For the sake of uniformity all foremen were later placed on an hourly basis, the basic eight-hour day was established and the increases were made retroactive to January 1, 1918.

Other classes of labor in the shops were granted increased wages under the provisions of Supplement No. 7 issued September 5, 1918, the minimum rates established being \$110 per month for stationary engineers; \$90 a month for stationary firemen and power house oilers; 38 cents an hour for locomotive boiler washers; 33 cents an hour for power transfer and turntable operators; 31 cents an hour for shop, roundhouse and storehouse laborers, and 28 cents an hour for common labor. The rates specified in Supplement No. 7 were not retroactive but were effective September 1, 1918.

The increases in the wages resulting from the application of the new schedules have been variously estimated at from 40 to 60 per cent in the locomotive department and from 40 to 90 per cent in the car department, varying considerably, depending on the basis of payment previously in force. The supplements to General Order No. 27 made no provision for increases in the piece work prices, and this has resulted in the abolition of piece work in practically all shops. In general the mechanical department employees were well pleased with the wages awarded by Supplements 4 and 7. The migration of railroad shop employees to other industries practically ceased and many who had left railroad service returned to their former occupations.

Director General McAdoo stated that he expected every railroad employee, by faithful and efficient service, to justify the large increases of pay granted to them. However, the evidence at hand indicates that this result was not secured. The shopmen were given an opportunity to increase their earnings very materially, but instead of working steadily after the new rates went into effect, many of the men worked only enough days in each month to earn a small amount in excess of what they formerly received. The percentage of absentees in the shops was in some instances as high as 30 and to find 20 to 25 per cent "laying off" was not unusual.

While piece work systems were not abolished, the earnings under existing piece work rates were in most cases only slightly higher and in some cases even lower than the established minimum wage for mechanics. Consequently when the higher rates went into effect, there was no longer sufficient incentive for men to increase their production to a point where they would earn more than the guaranteed rate per hour. On the few roads where the rates earned on piece work were considerably higher than the present wages, the system is still in effect and the unit production has not fallen off appreciably, but where the incentive has been removed, the output has fallen very markedly.

Records of the average earnings on roads which had piece work systems before and since the wage increases went into effect are available. On one typical road these data showed that whereas the men earned an average of 45 cents an hour under the old piece work system, they were now earning 35 cents an hour, but were of course receiving the minimum rate of 58 cents an hour. On another road it was found that the output was but 60 per cent as much per man as formerly and 40 per cent as much work was being turned out per dollar as before. These are by no means extreme instances, as in some cases the records for whole shops show that the men's earnings have dropped to from 20 to 30 per cent of what they had been while the work was being done at piece rates. It is probably no exaggeration to say that in the shops

where piece work has been eliminated, the output per man has decreased 30 per cent and the labor cost of doing the work has increased 50 per cent.

The experience gained during the past year demonstrates plainly that increasing the hours worked does not increase the output in proportion. In general as much work was done in a ten-hour day as in a thirteen-hour day and the officers of one road stated that they expected to secure practically the same output with the shops running 48 hours a week that was obtained when the men were working 70 hours a week. It should be stated, however, that the eight-hour day has not been received with favor, particularly by the car men, and under this condition the normal production cannot be secured.

In considering the records of the shops, the fact must not be overlooked that supervising officers were working under unfavorable conditions. The foremen as a class were underpaid. Many had given up their positions to return to work at the trade and this tendency became even more marked after the issuance of General Order No. 27. Had the foremen been granted salaries commensurate with their responsibilities the labor situation would undoubtedly have been improved. The inadequate wages not only made it difficult to secure competent men for the supervising forces, but it also resulted in the foreman losing authority as, where the workers receive higher wages than the supervising forces, they feel that the foremen are their inferiors and obey instructions grudgingly, if at all. It was not until November 1 that the supervising forces were granted adequate wage increases. While the final wage scales for the foremen were in general quite satisfactory, they came too late. The most trying times had passed and the roads had lost the full production that might have been secured had the foremen been able to exercise complete authority in the management of the shops.

Special Supplements for Other Classes of Employees

Aside from the shop and maintenance of way employees, several other large groups of railway workers received special consideration in supplemental orders. Thus Supplement No. 7, referred to previously, also granted increases in pay to clerks in all departments, station employees and laborers in stations, storehouses and warehouses. In the case of employees paid by the month this supplement, in general, granted increases of \$25 per month over rates in effect on January 1, 1918, with minimums of \$87.50 for clerks, \$45 for boys under 18 years of age serving as messengers, office boys, etc., \$70 for janitors, elevator operators, watchmen, etc.

Supplement No. 10, dated November 16, announced increases to telegraphers, telephone operators, except switchboard operators, agent telegraphers, agent telephoners, towermen, levermen, tower and train directors, block operators and staff men. Under this supplement wages in effect January 1, 1918, were reduced to an hourly basis according to a formula given and to which an increase of 13 cents was added, with a minimum of 48 cents per hour. These advances were made effective as of October 1. On October 23 Supplement No. 11 was announced granting wage advances to non-telegrapher station agents. This was essentially an advance of \$25 per month with a minimum of \$95.

Train and Engine Service

The train and engine services were probably affected less by the labor shortage than any other class of employment. The reason for this is obvious; employment in these services is more attractive than in any other, so that outside employment did not offer sufficient inducements for men in the train or engine service to leave the railways, while most applicants for railway employment naturally preferred work in train and engine services to that in any other branch of the service.

Owing to the operation of seniority rules in both the train and engine services, any shortage of men would be manifested only in the positions at the bottom of the ladder. There were shortages in certain localities at different times in the ranks of firemen, brakemen and switchmen, but apparently the worst shortage occurred during the influenza epidemic of recent months. In the East, particularly in the New York district, some difficulty was experienced in keeping the switching forces at a working level, making it necessary to lower the standards in recruiting men. In the West some shortage of firemen and brakemen was experienced in the Northwest states, but practically no difficulty was experienced in the Southwest. This is explained primarily by differences in traffic which was depressed to a considerable measure in the Southwest by an adverse season. Train and engine service employees have received no wage awards other than that granted them by General Order No. 27, but representations have been made to the Board of Wage and Working Conditions concerning which no report has appeared to date.

The Accounting Department

Even in the past it has been customary in the accounting department of many of the larger railroads to employ women for some classes of work. The individual opinions of accounting officers differ greatly as to the extent to which they can be profitably employed instead of men. There are not a few accounting officers who express the opinion that in normal times it is better to employ men only in the general auditing offices as well as in freight offices. Others are of exactly opposite opinion and believe that women are better fitted for the greater part of the routine work of clerks in audit offices than are the classes of men who can be attracted by the comparatively low wage which has been paid. The result of the war and scarcity of men, especially those of the age employed in auditing offices, led to the substitution of girls for men even where the policy of the road or the opinion of the auditor was against such substitution. There was, however, comparatively little of drastic change in such employment of women to do men's work. Certainly, there was no such new experiment involved as was involved in the employment of women in shops, as track laborers, or in signal towers.

From such canvass of accounting officers as the *Railway Age* has made, opinion appears to be divided as to the desirability of continuing the employment of women where before the war men were employed. For instance, on one road it is pretty generally believed that the substitution of women and the extension of the use of computing machines and tabulating machines forced on the road by scarcity of men has resulted in demonstrating quite clearly the economy and feasibility of such a change. On another road, competing in the same labor market, the consensus of opinion appears to be that even where more extended use is made of calculating and tabulating machines, it is, under ordinary circumstances, more economical to employ boys to operate the machines than to have girl operators. Accounting officers in other parts of the country are similarly divided in opinion. The great majority would agree, however, that extension of the use of mechanical devices has tended toward greater efficiency in the audit office.

One objection to the use of women throughout the work of an auditor's office below the rank of chief clerk is that no chief clerks are being trained in the ranks. The question, of course, arises as to whether in time women may not rise from the ranks and qualify as chief clerks. Most auditors doubt this, but time only can prove it. It will be recalled that when girls first began to be employed extensively as stenographers in railroad offices, the cry of "Where are we going to get our next generation of railroad officers from, if none are being trained as stenographers?" was raised. The

question thus raised solved itself owing to the fact that it was still necessary for quite large classes of railroad officers to employ male stenographers if for no other reason than because of the necessity of traveling over the line at frequent intervals, and, furthermore, because of the fact that there were plenty of other ways for an embryo railroad officer to get a training in railroad work other than starting in as a stenographer. The objection to the employment of women in the accounting offices, however, has somewhat more force. It is quite feasible to employ women exclusively as clerks in nearly all branches of audit office work, and it is not so apparent that the future chief clerk and accounting officer can get the necessary training to fit him for his job in any other way than serving as a clerk.

Some roads after they began to employ women in the auditor's office more extensively, adopted a system of giving the clerks a rest, even if but for a few minutes, at frequent intervals during the day, the single rest period at lunch time being thought to be insufficient. Where a five or ten-minute rest period at intervals of two or three hours has been adopted, it is generally considered to work well and to increase rather than decrease the output of the clerks. This might, however, have been equally the case had it been tried out with men clerks in the way it is now being tried out with the girls.

Government Attitude Toward Labor

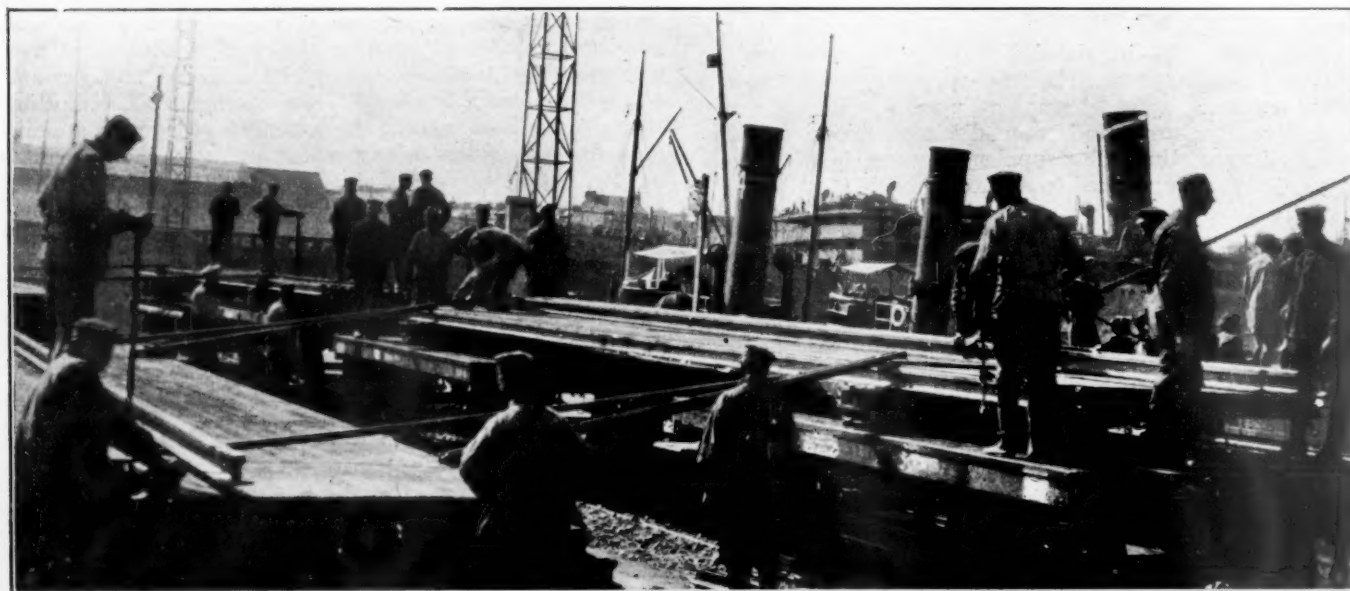
In no branch of the railroads has the effect of the government attitude toward labor been more clearly shown than in the mechanical department. One of the first significant changes was a marked increase in the number of men enrolled in labor organizations. Soon after the Railroad Administration announced that no distinction should be made between members and non-members of labor organizations, representatives of organized labor appeared at the shops where the mechanics had not already formed unions. As a result of the activities of the federation, there is probably not a shop in the country today in which a local lodge has not been formed. This movement has been furthered by the evident advantages of organized labor in enforcing its claims on the administration and by the widespread opinion among the workers that organized labor has been especially favored in the wage awards.

The removal of the power of determining wages from the officers of the individual roads has had an unfortunate effect on discipline, particularly in the shops and among train

service employees. The men became imbued with the belief that any favors they were to receive would be determined by the authorities at Washington and that the administration of discipline would likewise be governed by the central body. This has resulted in flagrant cases of insubordination. Men have refused to obey the orders of their supervisory officers, have denied their power to discharge them and whenever they were not satisfied with decisions in matters affecting wages or working conditions, have carried the matter to Washington in the form of complaints or grievances. In general the men have been inclined to give credit for all the benefits they have received to the Railroad Administration, but have placed all the blame for undesirable conditions on the local officers. The general detrimental effect of this situation on the morale of the workers can readily be appreciated.

Later in the year, the administration officers seem to have arrived at a realization that the men were not giving a fair day's work for a fair day's pay. Belated attempts were made to increase the production of the shops. The general supervisors of equipment visited a number of shops and by personal appeal endeavored to speed up the workers and restore discipline. These men have stated that the workers are not giving the government the output which they had given to the railroads under private control, regardless of the fact that wages have been increased and working conditions improved. In one case following an unpopular reduction in the working hours, the men deliberately cut the output more than 50 per cent. The equipment inspectors have also insisted that insubordination must cease, and that shopmen must obey their officers. This movement should result in better output in a short time under the present conditions.

Since the signing of the armistice labor conditions have undergone a rapid change. In the sections of the country where many war industries are located, there are now plenty of mechanics available. In other sections a slight shortage of skilled labor is reported. The working period in the shops has been reduced to eight hours per day and where it is found that a single shift will not give the required output, the second shift is to be organized. This arrangement has been put in force in order to give employment to the maximum possible number of men during the reconstruction period. With the decrease in the demand for skilled labor there has come a change in the attitude of the worker. The unit production probably reached the low point during the last months of the year and during the coming months there should be a marked improvement both in morale and output.



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German Prisoners Unloading Rail at St. Nazaire, France

The Standardizing of Operating Statistics

Scope and Purposes of the Railroad Administration's New Plan for Uniformity in Statistical Reports

By Wm. J. Cunningham*

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WHEN THE operating statistics section of the United States Railroad Administration's Division of Operation was created in April, 1918, it was charged with three important tasks. The first was to devise a plan for the roads under federal control which would insure uniformity in the compilation and reporting of the statistics which deal with operating efficiency; the second was to prepare the report forms and to promulgate instructions making the standard methods and report forms effective; the third was to utilize, for the purposes of administrative control, the information made available by the new reports. The first two tasks have been practically accomplished. They related to the organization of ideas. The third task, which is one of operation, is in the early stages of development.



W. J. Cunningham

The methods and forms were promulgated under date of July 15, 1918, and were made effective with the reports for the month of August. At this date, it may be said that the operating statistics section, and its Advisory committee on operating statistics,† have, by standardizing operating statistics, brought about in that field what the Interstate Commerce Commission has accomplished in standardizing railroad accounting. It is now possible to make comparisons of the operating results of individual railroads, and of districts and regions, not only with respect to the financial features which are reflected in the monthly and annual report forms prescribed by the Interstate Commerce Commission, but also with respect to the important units of physical performance, as reported on the new standardized operating statistics forms. The qualifications and uncertainties heretofore due to variations in statistical practice, no longer attach to the interpretation of the statistics relating to train performance and to the utilization of locomotives and cars.

Everyone who has studied the statistics of physical performance of individual roads, or who has attempted to make comparisons as between roads, has found wide divergencies in statistical practice. Not only have there been noticeable differences in the several regions, but as between roads in the same territory there have been marked variations in methods and in bases which invalidated an unqualified comparison of units. Some roads have had well developed and scientific statistical systems; others have been content with little more

than the rather meagre statistical requirements of the Interstate Commerce Commission. The Commission has been interested primarily in the financial returns, and its requirements have touched but lightly on statistics of physical performance.

The policy of the operating statistics section in designing the new forms and setting the new requirements, has been to continue the best in current practice, and at the same time to avoid placing too great a burden on the larger number of roads which have not been so progressive in that respect. The aim has been to utilize all of the basic data heretofore called for by the annual reports of the Interstate Commerce Commission, and to superimpose upon that structure the additional information considered essential to a scientific exhibit of the more important phases of physical performance. The new plan is not complete. It is believed, however, that the initial requirements are scientifically comprehensive without being carried so far toward the ideal as to be impractical or unjustifiably burdensome.

While the new plan was made effective with the figures for August, 1918, it was not possible to obtain complete returns for the first two months. A large amount of correspondence and many conferences were necessary to insure a clear understanding on certain features which were new to many roads. The October returns, however, are fairly complete, and, beginning with that month, the Operating Statistics Section is attempting to fulfill its functions of utilizing the figures for purposes of administrative control.

Purposes of Standard Forms

The purposes of the standard forms, as announced by Director of Operation Carl Gray's circular of July 15, 1918, are:

(a) To furnish the director general, the director, division of operation, and the regional directors with the basic data and the significant averages, ratios or unit costs which relate to or furnish indices of operating efficiency. Insofar as it is practicable the information on these forms will be utilized in supplying, through the operating statistics section of the division of operation, the statistical requirements of the several sections of the division of operation or of other divisions.

(b) To provide uniform bases, methods and forms which will insure uniformity in practice, and avoid any question as to comparability in so far as bases and methods are concerned.

While it may appear that the primary object of the new plan is to keep the central administration currently informed, and to furnish its officials and the regional directors with the data necessary to an intelligent supervision of operation, it is just as much the intention to give the local officials (the federal managers, general managers, and their subordinates) much information not heretofore universally available. The distribution of the monthly summaries, which show for each road and each region, the basic data and significant units, are designed to increase the interest of the local officials in operating efficiency by informing them not only as to their own results, but also as to those of other roads with which comparisons may fairly be made. It is realized that statistics are effective only to the extent that they are used, and that their use by the local officials should be more effective than

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†The committee met from time to time during April and May. It consisted of G. R. Martin, vice-president, Great Northern; J. G. Drew, vice-president, Missouri Pacific; H. W. MacKenzie, comptroller, Seaboard Air Line; J. J. Ekin, general auditor, Baltimore & Ohio, and W. C. Wishart, statistician, New York Central. The manager of the operating statistics section acted as chairman.

their use by the central or regional directors. The potential value of the figures lies in their successful application locally. Their value to the central or regional officials lies in their indication as to the extent and the effectiveness of the interest taken locally in improving the units of efficiency.

There is abundant evidence to support the belief that greater interest is now being taken in the figures, and that this added interest will yield substantial returns in increased attention to the details of operation which find their expression in the statistical units.

It is unnecessary to describe the plan in detail, as the forms are familiar to the majority of the readers of the *Railway Age*. The principal purpose of this article is to discuss a few of the fundamentally important principles and to explain why certain data are considered essential to a comprehensive statistical plan.

The first series of forms are numbered O. S. 1 to O. S. 7, inclusive, the prefix O. S. being the symbol assigned to the Operating Statistics Section. O. S. 1 relates to freight train performance; O. S. 2, to passenger train performance; O. S. 3, to locomotive performance; O. S. 4, to distribution of locomotive hours; O. S. 5, to freight car performance; O. S. 6, to locomotive and train costs, and O. S. 7, to the income account.

The more important features which are new to many roads appear in the reports giving the details of freight train performance, and the distribution of locomotive hours (Forms O. S. 1 and O. S. 4).

Form O. S. 1, Freight Train Performance

The freight service afforded the widest field for harmonizing differences in statistical practice and for setting scientific standards, as it has the greatest opportunities for statistical control.

The standard report of freight train performance gives the customary statistics pertaining to train miles, locomotive miles, and car miles. It is confined to "straight" freight service, and does not include mixed and special trains.

In addition to the statistics just mentioned, the form calls for the following data not heretofore universally compiled, viz:

Gross ton miles;
Net ton miles (from the train reports);
Rating ton miles;
Train hours.

Gross ton miles are defined as the gross weight of the train (cars, contents and caboose) multiplied by the miles the train is moved. The figures are to be compiled from the conductor's train report. Gross ton miles represent the gross transportation product of train miles and locomotive miles. They are the product which may be credited to the operating department, and against which the direct expenses of train wages, fuel and other locomotive and train supplies may be charged. Subject to qualifications which will be referred to, gross ton miles are the best measure of train and locomotive efficiency. They represent the weight behind the drawbar and the distance which that weight is moved.

The computation of gross-ton miles has been common throughout the West and Southwest, but has not been as common throughout the South and East. An examination of the statistical reports of all railroads made by the operating statistics section last May indicated that they were computed either for the entire system or for parts of systems making up about 75 per cent of the road mileage of all Class 1 roads in the United States. The requirement that gross-ton miles be made a standard measure, therefore, introduced nothing new to the great majority of railroads. However, there have been differences in the methods used which made it difficult to compare the figures. Some roads adopted certain arbitraries, instead of making exact computations; others included only the slow, or tonnage freight trains; and others added in the weight of the locomotives, so as to afford a measure of traffic density for the purposes of maintenance of

way statistics. It is now required that gross-ton miles shall be computed from the actual gross weights as reported for each car in the train on the conductor's "wheel" report. The weight of the locomotive is not included, as it is not considered a part of the transportation product.

Net-ton miles are defined as the net weight of the freight (revenue and non-revenue) in the cars of the train, multiplied by the miles the train is run. These figures, as well as the gross-ton miles, are taken from the conductor's train report, and therefore correspond with the gross-ton miles. The net-ton miles thus derived represent the net-transportation product which should be credited to the operating department, but the figures should always be related to the gross-ton miles when an analysis of operating results is undertaken.

There is nothing new in net-ton miles as a measure of train efficiency. The novelty is in the method of compilation. Except in the few cases where the net-ton miles have been derived from the same source as the gross-ton miles, the net-ton miles compiled from waybills have been used for train efficiency statistics. For reasons which will be cited the waybill ton miles cannot satisfactorily answer the purposes of a scientific exhibit of freight-train performance, although they are valuable as a measure for obtaining the average revenue per ton mile and the average haul per ton. Ton-mile statistics have been required for many years by the Interstate Commerce Commission, and it has been the common practice for railroads to use these figures as a base for obtaining the train load and the car load.

Net-ton miles from the waybills are defective as a measure of train efficiency because they do not correspond to the actual production of the train miles and car miles of a given period, and because they are not available in time for current and effective use. Waybill ton miles for a given month are based on the waybills actually taken into account in that month. There is always a "lap-over" of ton miles which should have been credited to the performance of the previous month, and a shortage of ton miles actually produced in that month, but not taken into account until the following month. In theory, under normal conditions, the "lap-over" should balance the shortage, but in practice there is always a discrepancy, its degree depending upon local conditions. An interruption due to congestion, washouts, or snow blockades, may delay the billing on a substantial percentage of the freight, particularly if the trouble occurs during the latter part of the month. Consequently the train, locomotive, and car miles made in that month, and their operating expenses, will be charged against that month's performance, but a considerable amount of the transportation product is held up to go into the accounts of the next month.

Under governmental control the extent of this "lap-over" has increased because of the adoption of the universal interline waybill, which has resulted in a greater proportion of interline waybills. These are the waybills which are slow in being taken into account. Moreover, the "short-routing" of freight, the common use of paralleling lines, and of terminals and other accounting short cuts, which are authorized under unified control, add to the difficulties of giving each road and each month its proper credit for ton-mile production.

Finally there is the objection of delay in obtaining the information. Waybill ton miles are rarely available until well along in the second month. The waybill ton miles of January are usually not available until March 15. The information is then too old to be used effectively for operating control.

The computation of net-ton miles from the conductor's train reports is, in a measure, a duplication of the work of compiling similar information from the waybills, but it is believed that the additional expense is amply justified. Under the new plan the net production in ton miles is available on the 15th day of the following month, or one month earlier than the waybill ton miles. There can be now no question concerning the propriety of comparing the net with the gross ton miles, nor with relating both units of product with the

train miles, locomotive miles, train hours, and operating expenses of the particular period under review.

It may be possible later to utilize the net-ton miles, from the "wheel" reports, for the purposes of the Interstate Commerce Commission, and thus avoid the duplication of effort. This proposal is now under consideration.

Rating-ton miles are defined as the potential production in

tio as low as 50 per cent may not imply criticism. It may actually represent a relatively good performance when consideration is given to the character of the traffic, unbalanced movement, or adverse weather conditions. The ratio in that case is not to be interpreted as an indication that the operating department was but 50 per cent efficient. It is proper, however, to compare that ratio with the same ratio of preceding months, and to make inquiries as to the reasons for changes. If it were permissible to have a varying base the ratio would not show the effect of changes in the relative proportion of fast freights, and would not show the effect of cold weather, requiring arbitrary reductions in tonnage ratings.

The principle adopted is that the general average for all freight trains shall be expressed in terms of summer rating for slow freights. It may not be proper to make absolute comparisons between the ratios of individual roads because of differences in traffic and operating characteristics, but it is

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Form O. S. 1
Page 1 of 2 pages

(Name of reporting carrier)

FREIGHT TRAIN PERFORMANCE
(Not including mixed, special, or motor car trains)

Month of _____, 191 , compared with same month of previous year.

ITEM	MONTH OF		INCREASE OR DECREASE	
	THIS YEAR	LAST YEAR	AMOUNT	PER CENT
1. (a) Average miles of road operated..... (Note A)				
(b) Average miles other main tracks operated..... (Note A)				
2. Train miles (Note B):				
(a) East				
(b) West				
(c) Total				
3. Locomotive miles (Note B):				
(a) Principal and helper, east.....				
(b) Light, east.....				
(c) Principal and helper, west.....				
(d) Light, west.....				
(e) Total.....				
4. Car miles (thousands) (Note B):				
(a) Loaded, east.....				
(b) Loaded, west.....				
(c) Loaded, total.....				
(d) Empty, east.....				
(e) Empty, west.....				
(f) Empty, total.....				
(g) Caboose, east.....				
(h) Caboose, west.....				
(i) Caboose, total.....				
(j) Total, east.....				
(k) Total, west.....				
(l) Grand total.....				
5. Gross ton miles (thousands) (Note C):				
(a) East.....				
(b) West.....				
(c) Total.....				
6. Rating ton miles (thousands) (Note D):				
(a) East.....				
(b) West.....				
(c) Total.....				
7. Net ton miles (thousands) (Note E):				
(a) East.....				
(b) West.....				
(c) Total.....				
8. Train hours (Note F):				
(a) East.....				
(b) West.....				
(c) Total.....				

NOTES.

(A) Miles of road—miles of first running track. Miles other main tracks—miles of second, third, fourth, or other multiple running tracks, not including yard tracks and sidings.

(B) Follow "Classification of train miles, locomotive miles, and car miles," Interstate Commerce Commission, July 1, 1914. Includes electric locomotive miles, but excludes mixed, special, and motor car trains. Train miles—Account 801, both ordinary and light; locomotive miles—Account 811; car miles—Account 821. Where movement of traffic as a whole is not east and west, subdivide north for east and south for west, or combine north and south with east and west according to traffic movement.

(C) Gross ton miles—tons of 2,000 lbs. behind locomotive (empty, loaded, and caboose) moved one mile; to be computed from conductor's train reports. Includes electric locomotive miles, but excludes mixed, special, and motor car trains.

(D) Rating ton miles—the potential gross ton miles which would have been produced had all trains been loaded to 100 per cent of the slow freight rating for normal weather conditions, taking account of changes in rating over sections of the run. When the potential train load in the direction of average travel is not expressed in number of cars an arbitrary tonnage rating should be used as the basis for Item 6.

(E) Net ton miles—tons of revenue and nonrevenue freight moved one mile; to be computed from the conductor's train reports.

(F) Train hours—the elapsed time of train between the time of leaving initial terminals and time of arrival at final terminals, including delays on the road. May be taken from conductor's train reports or from dispatcher's train sheets.

Form O. S. 1, Sheet 1

gross-ton miles based on the rated train load for each train run; in other words, the gross-ton miles which would have been produced if every train had been loaded to 100 per cent of the slow freight rating for normal weather conditions. The gross-ton miles show the actual production; the rating-ton miles, the potential production; the ratio of the former to the latter is an index of train loading efficiency.

The purpose of basing the potential on the summer slow freight rating for all classes of freight trains may not be thoroughly understood. The suggestion has been made that it is unfair to charge a superintendent with the slow freight rating for a preference freight or for a way freight, and that it is unfair to refuse him credit for necessary reductions in ratings because of abnormal weather conditions. The force of this suggestion is recognized, but the answer is that the 100 per cent base must be fixed. It is the "bench mark" from which the degree of variation in performance is to be measured. A movable base would defeat the purpose of the report. It is recognized that the ratio of actual to potential cannot be 100 per cent unless the ratings are too low. A ra-

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Form O. S. 1
Page 2 of 2 pages

(Name of reporting carrier)

FREIGHT TRAIN PERFORMANCE
(Not including mixed, special, or motor car trains)

Month of _____, 191 , compared with same month of previous year.

ITEM	MONTH OF		INCREASE OR DECREASE	
	THIS YEAR	LAST YEAR	AMOUNT	PER CENT
AVERAGES.				
9. Per freight train mile:				
(a) Locomotive miles, east (excl. light)..... (5a + 5b)				
(b) Locomotive miles, west (excl. light)..... (5b + 5c)				
(c) Locomotive miles, total (excl. light)..... (5a + 5b + 5c)				
(d) Loaded car miles, east..... (4d + 4e)				
(e) Loaded car miles, west..... (4e + 4f)				
(f) Loaded car miles, total..... (4d + 4e + 4f)				
(g) Empty and caboose car miles, east..... (4g + 4h) + 5a				
(h) Empty and caboose car miles, west..... (4h + 4i) + 5b				
(i) Empty and caboose car miles, total..... (4g + 4h + 4i) + 5c				
(j) Total car miles, east..... (4j + 5a)				
(k) Total car miles, west..... (4k + 5b)				
(l) Total car miles, total..... (4j + 4k + 5c)				
(m) Gross ton miles, east..... (5m + 5a)				
(n) Gross ton miles, west..... (5n + 5b)				
(o) Gross ton miles, total..... (5m + 5n + 5c)				
(p) Rating ton miles, east..... (5p + 5a)				
(q) Rating ton miles, west..... (5q + 5b)				
(r) Rating ton miles, total..... (5p + 5q + 5c)				
(s) Net ton miles, east..... (7s + 5a)				
(t) Net ton miles, west..... (7t + 5b)				
(u) Net ton miles, total..... (7s + 7t + 5c)				
10. Per freight train hour:				
(a) Train miles, east (speed in miles per hour)..... (5a + 5b)				
(b) Train miles, west (speed in miles per hour)..... (5b + 5c)				
(c) Train miles, total (speed in miles per hour)..... (5a + 5b + 5c)				
(d) Gross ton miles, east..... (5d + 5a)				
(e) Gross ton miles, west..... (5e + 5b)				
(f) Gross ton miles, total..... (5d + 5e + 5c)				
(g) Net ton miles, east..... (7g + 5a)				
(h) Net ton miles, west..... (7h + 5b)				
(i) Net ton miles, total..... (7g + 7h + 5c)				
11. Net ton miles per loaded car mile:				
(a) East..... (7a + 4a)				
(b) West..... (7b + 4b)				
(c) Total..... (7c + 4c)				
12. Per cent loaded to total car miles (excl. cabooses):				
(a) East..... 4a + (4a + 4d)				
(b) West..... 4b + (4b + 4e)				
(c) Total..... 4c + (4c + 4f)				
13. Per cent net ton miles to gross ton miles:				
(a) East..... (7a + 5a)				
(b) West..... (7b + 5b)				
(c) Total..... (7c + 5c)				
14. Per cent gross ton miles to rating-ton miles:				
(a) East..... (5a + 5a)				
(b) West..... (5b + 5b)				
(c) Total..... (5c + 5c)				

Form O. S. 1, Sheet 2

proper to compare the ratio of any one road in any one period with its corresponding ratio in another period.

Train hours are defined as the aggregate elapsed time of trains between the times of leaving initial terminals and of arrival at final terminals, including delays on the road. A relatively small number of roads have taken cognizance of the importance of the time element in operating statistics, but it seldom is sufficiently emphasized. In these times, when maximum production is the desideratum, the product must be

measured by time as well as by volume per train unit. If an increase in the train load is accomplished at the sacrifice of a correspondingly greater reduction in train speed, the net result is a loss in ton miles per train hour. The unit "Ton miles per train hour" is obtained by dividing the total ton miles by the total train hours. Train efficiency may be increased (a) by increasing the train load without a corresponding reduction in train speed; (b) by increasing the train speed without a corresponding reduction in the train load; or (c) by increasing both the train load and the train speed. The effect of the changes in one or both factors is reflected in ton miles per train hour. The policy of the operating statistics section is to emphasize the importance of this unit in analyzing the net results of train operation. The prime importance of the time factor is recognized also on Form OS-5, in the unit "Ton miles per car day." The two elements—weight and speed—must be considered both separately and together. The units just described reflect their combined effect.

Attention is directed to the fact that all of the basic data, averages and percentages are shown separately by directions. The figures are reported as east, west and total, the instructions providing that in the cases where the movement of traffic as a whole is not eastward and westward, north should be substituted for east, and south for west, or north and south should be combined with east and west according to the traffic movement. This subdivision of the statistics is of the highest value in analyzing the results, inasmuch as it is possible to determine the effect of unbalanced traffic and of other operating or traffic features which are favorable in one direction and unfavorable in the opposite direction. It frequently happens that the total train load (both directions combined) will show no change, yet an analysis will develop the fact that a marked loss has occurred in one direction, this loss being neutralized by a corresponding gain in the opposite direction. Without the statistics by directions a loss in one direction would not be known and no credit would attach to the gain in the other direction.

Averages and Ratios—From the basic data on the first page of Form OS-1, the significant averages and ratios are derived and reported on page 2. The more important of these units have already been referred to in the discussion of the basic data.

Of first importance is "Net ton miles per train hour." This is the resultant of the average net train load and the average train speed in miles per hour. Since all of the items on the report call for a comparison with the previous year, and for the amount and percentage of increase or decrease, it is easy to measure the relative effect of changes in the components of any average.

How Results Are Analyzed

To illustrate, a specific case may be taken with the actual figures. The net ton miles per train hour show an increase from 4,877 to 5,216, or 6.9 per cent. This better performance was due to an increase in the net train load from 488 to 499, a gain of 2.3 per cent, and an increase in the train speed from 10.0 to 10.5 miles per hour, a gain of 5.0 per cent. Next in order, an examination may be made of the factors which influence the net train load. In the first place, it is noted that the ratio of locomotive miles to train miles shows a slight increase from 1.032 to 1.041, or 0.9 per cent. This indicates, probably, a slightly greater use of helpers or double-headers. Next, it is found that the net tons per loaded car mile increased from 22.5 tons to 24.2 tons, a gain of 7.6 per cent. The changes in these factors should have a favorable influence on the train load. On the other hand, it is noted that the per cent of loaded to total car miles—74.4 per cent last year, 71.2 per cent this year—shows a loss, a decrease, of 4.3 per cent, and that the per cent of net ton miles to gross ton miles fell from 47.0 per cent to

46.1 per cent, a loss of 1.9 per cent. These factors exert an unfavorable influence on the net train load. Finally, it is found that the per cent of gross ton miles to rating ton miles has changed in the right direction—76.5 per cent to 77.3 per cent, an increase of 1.3 per cent. These changes may be summarized:

FAVORABLE		Per cent
Car load increased		7.6
Per cent of rating hauled increased.....		1.3
UNFAVORABLE		
Per cent of loaded car miles decreased.....		4.3
Per cent of net to gross ton miles decreased.....		1.9
INCIDENTAL FACTORS		
Ratio of locomotive miles to train miles increased.....		0.9
Loaded car miles per train mile decreased.....		4.6
Empty car miles per train mile increased.....		11.6
Total car miles per train mile decreased.....		0.3
Gross ton miles per train mile increased.....		4.6
Rating ton miles per train miles increased.....		3.1
NET RESULT		
Net tons per train mile increased.....		2.3

The changes in each average or ratio may be analyzed by referring to the changes in the basic data. For example, what caused the loss in the per cent of net to gross ton miles? By referring to the basic data, it is found that both net ton miles and gross ton miles show an increase, but the increase in gross was 17.8 per cent, while the increase in net ton miles was 15.4 per cent. The cause of this is seen in the car mile statistics, where the empties show an increase of 26.4 per cent, while the loads show an increase of but 7.5 per cent. Since all of the statistics are shown separately by directions it is possible to trace the effect of changes in the relation of eastward to westward traffic. In this case, it is noted that the per cent of increase in gross ton miles was identical in each direction, viz., 17.8 per cent, but, in the case of net ton miles, the increase eastward was 16.8 per cent, while in the westward direction the increase was but 12.6 per cent. The loss, then, occurred in the westward movement. Looking again at the car miles, it is seen that the loads in the eastward direction increased 17.0 per cent, while westward they decreased 5.4 per cent. With the empties, the conditions are reversed. Eastward they show an increase of 22.4 per cent; westward the increase was 27.5 per cent.

These examples show the possibilities of analysis of each single factor and its effect on units of performance. The forms are designed to reflect all important items of information, and each form, while independent in its own field, is interrelated to a greater or lesser extent with the other forms applying to other phases of operation. In other words, the forms are designed to "tie in" to each other and together to furnish the complete exhibit.

Form O. S. 2, Passenger Train Performance

The degree of refinement attaching to the statistics of freight train performance is not justified in connection with the passenger service. The latter is not so susceptible of control. The trains must be run as scheduled, whether they are fully or but partly loaded. Consequently there is little to be gained by computing gross ton miles in passenger service. Instead of gross ton miles, Form OS-2 calls for passenger train car miles as a measure of performance. No additional accounting is required, since all of the basic data are required for the purposes of the annual report to the Interstate Commerce Commission.

Form O. S. 3, Locomotive Performance

Compared with the orthodox locomotive performance sheet, this report appears to be rather meagre in scope, but, in connection with the data reported on Forms OS-1 and 2, it fur-

nishes the vital information for freight, passenger and switch service, in the following averages:

Locomotive miles per locomotive day—

(a) Serviceable locomotives;

(b) Total locomotives;

Per cent of serviceable to total locomotives;

Gross ton miles per locomotive mile—freight;

Passenger train car miles per locomotive mile—passenger;

Pounds of coal per locomotive mile—freight, passenger and switch;

Pounds of coal per 1,000 gross ton miles—freight.

Much of the information appearing on the average locomotive performance sheet, which the new form is designed to displace, appears on the reports of freight and passenger train performance, and of locomotive and train costs, (Forms OS-1, 2 and 6), as well as on Form OS-4, next described.

Form O. S. 4, Number of Locomotives and Distribution of Locomotive Hours

This form has caused more additional work than any other single report for the reason that, except on a very small number of roads, no data of the kind has heretofore been

UNITED STATES RAILROAD ADMINISTRATION
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Form O. S. 4

(Name of reporting carrier)

DISTRIBUTION OF LOCOMOTIVE HOURS

Month of _____, 1919, compared with same month of previous year.

Figures for previous year to be shown in red above figures for this year.

ITEM	FREIGHT SERVICE		PASSENGER SERVICE		YARD SWITCHING SERVICE		MIXED, SPECIAL WORK SERVICE		TOTAL TRAIN, YARD AND WORK SERVICE	
	Hours	Per Cent	Hours	Per Cent	Hours	Per Cent	Hours	Per Cent	Hours	Per Cent
SERVICEABLE LOCOMOTIVES.										
1. On road or in yard switching service.										
2. At terminals.										
3. In enginehouse:										
(a) Mechanical dep't.										
(b) Transportation dep't.										
(c) Total.										
4. Stored.										
5. Total serviceable (Items 1 to 4).										
	100		100		100		100		100	
UNSERVICEABLE LOCOMOTIVES.										
6. Awaiting repairs.										
7. Undergoing repairs.										
8. Stored or awaiting sale.										
9. Total unserviceable (Items 6 to 8).										
10. Grand total (Items 5 and 9).										
	100		100		100		100		100	
11. AVERAGE NUMBER OF LOCOMOTIVES:										
(a) Serviceable.										
(b) Unserviceable.										
(c) Total (Items 11a and 11b).										
	100		100		100		100		100	

NOTES.

Include all locomotives (steam and electric) on the road—owned, rented or leased, or assigned by U. S. Railroad Administration. Exclude owned locomotives in service on other roads.

Item 1, hours on road, represents the time in productive road and yard switching service. For locomotives in road service, it should be taken from conductor's train reports or dispatchers' train sheets, and based on hours from leaving time at initial terminal to arriving time at final terminal, including train switching time and delays on road. In yard switching service, the information may be taken from yard records, and based on hours between time locomotive leaves engine terminal to begin yard switching work and time it is returned to engine terminal.

Item 2, hours at terminals, represents time at terminals before and after the period of productive service, exclusive of enginehouse time reported in Item 3. For road service, it may be taken from enginehouse and yard records, and based on hours between time locomotive is delivered to transportation department and time locomotive leaves initial terminal, and between arriving time at final terminal and time locomotive is delivered to enginehouse force. For yard switching locomotives, data to be taken from enginehouse and yard reports, and based on hours between time locomotive is delivered to transportation department to engine terminal and time it leaves engine terminal for yard switching work, and hours between time locomotive reaches engine terminal at end of day and time it is delivered to enginehouse force.

Item 3a, in enginehouse for light running repairs and other enginehouse work. (See Items 6 and 7.)

Item 3b, in enginehouse after enginehouse force have completed their work and locomotive is available for service.

Item 4, locomotives under white load or stored, but in serviceable condition and available for service.

Item 6, in hands of or awaiting orders of mechanical department for repairs, when held more than 24 hours on that account.

Item 7, in shops or enginehouses undergoing repairs when held more than 24 hours on that account.

Item 8, include unserviceable locomotives stored while awaiting orders for sale, demolition, or other disposition.

Item 11a, obtained by dividing the number of hours in Item 5 by the number of hours in the month.

Item 11b, obtained by dividing the number of hours in Item 9 by the number of hours in the month.

Form O. S. 4.

kept. It has been necessary, therefore, to set up new records to meet the requirements. In effect it is necessary to account for every hour of every locomotive every day, and to show for serviceable locomotives the aggregate hours and the percentage of the total hours for each class of service:

- On the road in productive service;
- At terminals, standing-by, either before beginning or after completing the road run;
- In enginehouses for attention of the mechanical department;
- In enginehouses awaiting call from the transportation department.
- Stored while in serviceable condition.

A locomotive which is held out of service on account of needed repairs for a period in excess of 24 hours is classified as unserviceable. The hours of unserviceable locomotives are reported under three divisions:

- Awaiting repairs;
- Undergoing repairs;
- Stored or awaiting sale (or other disposition).

Considerable difficulty has been experienced in obtaining complete reports compiled strictly in accordance with the requirements of the form. It was considered inadvisable to promulgate rules in detail which would specify exactly how the local officers should arrange to gather the basic data. The Administration believed that the better plan would be merely to indicate by the form and by the foot notes what is desired, and let each road proceed in its own way to gather and compile the statistics. The same principle applied to the other forms, and the results have been satisfactory except in the single case of distribution of locomotive hours. It may be necessary to promulgate instructions which will specify in minute detail the sources of information and the methods to be followed locally.

The importance of this information as to locomotive utilization justifies the cost and the trouble incident to its compilation. The statistics thus far available show some remarkable variations in the per cent of time locomotives are usefully employed, the per cent of time they are standing-by at terminals, and the per cent of time they are in the engine houses. The data will be extremely valuable to supervising and executive officers in passing upon the recommendations of the local officers for new power. The low per cent of time on the road will surprise many who have had little conception of what it really is. Many will be astonished, too, to note the extent of the stand-by losses at terminals. These statements, however, should not be interpreted as underestimating the difficulties which are inherent in increasing the per cent of time on the road, or in decreasing the idle time at terminals before starting or after completing the run. Nevertheless, it is maintained that effective remedial measures may not be applied intelligently without a knowledge of the facts. Or, to state it in slightly different form, it is only by the aid of complete statistics that the way will be pointed clearly to effective remedies. The statistics may, in certain cases, prove to be embarrassing to local officials, but they should have no difficulty in explaining an apparently poor showing in locomotive utilization, if local handicaps are insurmountable. On the other hand, the figures should furnish the local officials with the most effective argument to support their recommendations for additional and improved terminal and enginehouse facilities, where such are needed.

The publication of the summaries of these reports for individual roads and for regions will undoubtedly cause a greater interest to be taken in obtaining the maximum practicable utilization of motive power.

Form O. S. 5, Freight Car Performance

The purpose of this form is to indicate the degree of efficiency in freight car utilization. The basic data consist of the number of cars on line daily (divided to show separately those which are serviceable and those which are unserviceable); the total freight car miles—loaded, empty and total; and the total net ton miles—revenue and non-revenue combined. From these figures are derived the three factors which reflect the measure of car efficiency:

- Net ton miles per loaded car mile;
- Per cent of loaded to total car miles;
- Car miles per car day.

The resultant of the three factors is as shown in the inclusive unit:

- Net ton miles per car day.

A gain in any one factor or a loss in any one factor increases or decreases the net result. If, for example, the car-

load is increased at the expense of the car miles per car day, or the per cent of loads, the net result may be a loss in net ton miles per car day, notwithstanding the greater car load. The net result may be improved by increasing one or more of the three factors, or by increasing one or two factors without causing a relatively greater decrease in the remaining factors. The tendency since the government assumed control of the railroads has been to increase the carload and to decrease the per cent of loads, the car miles per car day showing little change. During the early months of the year, the net result was a decrease in ton miles per car day, but in recent months the greater car load and the improvement in car movement has resulted in a net gain in ton mile productivity per car. It should be noted, however, that this unit does not reflect the collateral benefits to the shipping public by the better distribution of empty cars. The policy of the Administration has been to move the empties in train loads to the regions where they were needed for prospective loading, and while this has necessarily meant more empty car miles than were made prior to unified control, the amelioration of car shortage has meant less embarrassment to shippers.

Form O. S. 6, Locomotive and Train Costs

In this form an attempt is made to segregate what are commonly termed the "direct" or "out-of-pocket" expenses of train service, viz., locomotive repairs, enginehouse expenses, train enginemen, locomotive fuel, other locomotive supplies, trainmen, and train supplies and expenses. These expenses are shown separately for the freight and passenger services, and are related to the train miles, locomotive miles, gross ton miles (in freight service) and passenger train car miles (in passenger service), with average costs (a) per locomotive mile; (b) per train mile; (c) per 1,000 gross ton miles (freight); and (d) per 100 passenger car miles (passenger). There is nothing unusual in the form and it requires little additional accounting.

Form O. S. 7, Condensed Income Account and Operating Expenses by Primary Accounts

This is merely a reproduction of the condensed income account reported monthly to the Interstate Commerce Commission, and of the details of operating expenses by the primary accounts required by the annual report form of the commission.

Publication of Summaries

As already stated, the publication of the monthly summaries is still in the development stage. The August and September reports were too incomplete to permit summarizing. The October figures, however, are fairly complete, and summaries of the important figures on the reports of freight train operation, locomotive operation, distribution of locomotive hours, freight car performance, locomotive and train costs, and the income account, will be available before this article is printed. Hereafter they will appear regularly for each month at an earlier date. It is planned to have the summaries of physical performance distributed about the first of the second month, i. e., the summaries for December should appear about February 1. Those which show operating expenses should be available about two weeks later. The policy of the Administration is to give a general distribution of the summaries to the officers of the individual roads, as well as to the officers of the Administration, so that the information thus made available may have the widest field for usefulness.

The underlying theory of the new plan of standardized operating statistics is that the transportation department is charged with a given number of locomotive days and car days and is credited with its production in net ton miles.

The ton miles, in turn, are related to the expenditure in train miles, locomotive miles, and car miles, and the supplementary statistics throw light on the components of the train load and the car load, and the effect thereon of changes in ratios of net to gross ton miles, of loaded to total car miles, and of preference freights, or other lightly loaded trains, to total freight trains. The desiderata are that each locomotive and car shall be kept employed to its capacity and produce the maximum of ton miles with the minimum of train, locomotive, and car miles. The statistics are designed to show clearly the relation between the ton mile production and the time element in equipment utilization, and to indicate the relation between the actual and the potential train production.

The railroads in all sections of the country have cooperated cheerfully in making the new plan a success, and they are displaying an earnest effort to meet the requirements of the new forms. There is gratifying evidence that the adoption of the standard methods, and the more general distribution of summaries showing the operating results for all railroads, are doing much to increase the interest in operating statistics. The success of the new plan is to be measured by the use which is made locally of the reports of the individual roads, and the interest which is taken in the summaries. The results thus far are encouraging.

Railway Supply Problems

CHAIRMAN A. L. HUMPHREY of the committee on government purchasing policies of the Railway Business Association, has issued an invitation to railway supply men who may have criticisms or suggestions for "strengthening the association attitude, work or methods," to meet with the committee at the Hotel La Salle, Chicago, at 11 a. m., January 8. This is the day before the annual convention of the Railway Business Association.

Mr. Humphrey states that "it is the earnest hope of the present officers of the association that the forthcoming convention will be regarded and remembered by everyone in the railway supply craft as a democratic clearinghouse, whose conclusions are representative of the whole industry."

"All of us know a great deal more now about selling goods under government control than we knew on January 1, 1918. Such control will continue for a period not yet determined. Regardless of the ultimate disposition of the roads, government control for the immediate future will be our environment. What, if any, are the practices which the whole industry can agree in thinking could be modified advantageously to manufacturers and not to the injury of the public?"

"Are conditions of bidding on contracts satisfactory? Are contractual terms fair? Has the adjustment from a commission to a salary selling basis been successfully accomplished and without increase in selling cost? Have design and specification preserved employment to makers of appliances or material formerly established in use? Is it reasonably easy to obtain trials for new or partly demonstrated devices? Do federal officers observe commercial ethics in such matters as adherence to contracts and avoidance of cancellations? Have you found in the Railroad Administration an attitude of respect for the integrity and general character of railway supply men as a commercial group? Has the pre-war improvement in remittances for goods continued under government control and can you suggest ways of overcoming present obstacles to more rapid accounting and the adoption and enforcement of a standard period for remittances? What other phases if any do you believe deserve consideration?"

"If you cannot be present, the committee will discuss a letter and, if so stipulated, hold its source confidential."

Present Status of the Contract Negotiations

Few Roads Have Executed Their Contracts With the Government. Difficulties With the Short Lines

EVER SINCE THE LAW was passed by Congress taking over the railroads for operation by the government during the period of the war and for 21 months thereafter negotiations have been carried on between the legal departments of the railroads and the Railroad Administration in regard to the form of contract which was to be made between each company and the government. The Railway Executives Advisory Committee and the administration came to an agreement upon the standard form of contract on September 5, 1918.

After the standard form was agreed upon, each road necessarily had to apply it to its individual case, and apparently some considerable modifications will have to be made in the standard form to fit specific cases. On the other hand, the contracts that have so far been signed do not vary greatly from the standard form. The lists of roads show only those contracts which are furthest advanced. The others are in various preliminary stages which it would be hard to classify.

The compensation fixed in the contract is the rental which the government is to pay the corporations for the use of the roads, and from this compensation the corporations must pay their interest, corporation expenses and such dividends as they can pay.

CONTRACTS EXECUTED

Name of Road	Annual Compensation
Atchison, Topeka & Santa Fe.....	\$42,885,310
Buffalo, Rochester & Pittsburgh.....	3,276,410
Chicago, Burlington & Quincy.....	33,390,079
Chicago, St. Paul, Minneapolis & Omaha.....	4,934,789
Chicago & North Western.....	23,364,028
Colorado & Southern and Wichita Valley.....	2,833,578
Fort Worth & Denver City.....	1,891,386
Gulf, Texas & Western.....	29,734
Lehigh Valley.....	11,321,233
Minnesota & International.....	202,455
New York, Ontario & Western.....	2,103,589
Norfolk & Western.....	20,640,899
Northern Pacific.....	30,130,068
Richmond, Fredericksburg & Potomac.....	1,137,373

CONTRACTS CIRCULATED AMONG MEMBERS OF RAILROAD ADMINISTRATION STAFF AND REGIONAL DIRECTORS, BUT NOT YET EXECUTED BY DIRECTOR GENERAL

Name of Road	Standard Return as Certified by I. C. C.
Atlantic Coast Line.....	\$10,180,915.15
Atlanta & West Point.....	252,995.16
Augusta Southern.....	22,587.01
Birmingham & North Western.....	34,522.00
Central of Georgia.....	3,450,903.32
Central New England.....	1,468,123.63
Central of New Jersey.....	9,352,301.13
Charleston & Western Carolina.....	466,921.15
Delaware, Lackawanna & Western.....	15,749,476.74
El Paso & Southwestern.....	4,145,102.30
Gainesville Midland.....	22,731.00
Georgia.....	858,622.00
Georgia & Florida.....	d 562.98
Great Northern.....	28,666,681.07
Galveston Wharf.....	562,069.92
Lehigh & Hudson River.....	519,371.13
Pennsylvania Railroad East.....	46,312,932.00
Southern Pacific.....	38,021,937.62
Texas & Pacific.....	4,107,432.49
Trinity & Brazos Valley.....	d 238,904.66
Western Railway of Alabama.....	288,237.53
Washington Southern.....	468,432.81

d—deficit.

CONTRACTS DRAFTED AND SENT TO COMPANIES

Name of Road	Standard Return as Certified by I. C. C.
Abilene & Southern.....	
Alabama & Vicksburg.....	\$322,854.00
Anthony & Northern.....	
Buffalo & Susquehanna.....	
Boston & Maine.....	
Denison & Pacific Suburban.....	4,702.45
Fort Worth Belt.....	55,108.00
Georgia, Florida & Alabama.....	57,637.73
Fairchild & Eastern.....	
Los Angeles & Salt Lake.....	3,420,417.00
Kansas City, Mexico & Orient.....	9,073.00
Maine Central.....	2,955,696.88
New England Steamship Co.....	

Rutland.....	1,023,883.21
Salina Northern.....	
Union Freight of Boston.....	
Weatherford, Mineral Wells & Northwestern..	31,148.57

*Tentative draft submitted by company for discussion.

CONTRACTS PREPARED IN PRELIMINARY FORM, BUT AWAITING FURTHER INFORMATION FROM COMPANIES OR SETTLEMENT OF SPECIAL CLAIMS

Name of Road	Standard Return as Certified by I. C. C.
Atlanta, Birmingham & Atlantic.....	\$358,058.43
American Refrigerator Transit Co.....	
Ann Arbor.....	526,882.96
Buffalo Creek.....	409,397.00
Chicago, Milwaukee & St. Paul.....	27,154,551.02
Durham & Southern.....	134,221.70
Elgin, Joliet & Eastern.....	2,862,177.21
Erie.....	15,503,938.92
Escanaba & Lake Superior.....	58,688.01
Florida East Coast.....	2,842,842.20
Grand Rapids & Indiana.....	929,385.42
Louisville & Nashville.....	17,310,494.67
Louisiana & Mississippi Railroad Transfer.....	
Memphis, Dallas & Gulf.....	
San Antonio, Uvalde & Gulf.....	
Vicksburg, Shreveport & Pacific.....	
Winston-Salem Southbound.....	260,251.62

CONTRACTS DRAFTED BY COMPANIES AND SUBMITTED IN PRINTED FORM, BUT AWAITING FURTHER INFORMATION ON DECISION OF SPECIAL CLAIMS

Name of Road	Standard Return as Certified by I. C. C.
Bath & Hammondsport.....	\$7,221.43
New York Central and five allied companies.....	
New York, Susquehanna & Western.....	800,587.17
Ocean Steamship Co. of Savannah.....	
Union Pacific.....	

NOTE.—The present status of the contracts does not necessarily indicate the order in which they will be signed.

Short Lines

The Railroad Administration very early indicated that it did not care to be burdened with a large number of the so-called short-line railroads, and in spite of their protests announced its intention of relinquishing many of them from federal control, after they had received the same notices that were sent to other roads stating that they had been taken over by the government. This was partly because many of the smaller roads were not considered "needful or desirable" for the purposes of federal control, and partly because of the difficulty of reaching an agreement with the owners of the roads as to their compensation. On June 29 the Railroad Administration issued an order relinquishing nearly 2,000 small roads which were not considered needful or desirable, including some 1,400 plant facility roads as well as several hundred of the so-called short lines; but it had become apparent that many of the roads had been seriously affected by the fact of federal control whether any jurisdiction had been exercised over them or not, particularly by the uncertainty as to whether they had been taken over, and it was announced that "to preserve in every reasonable respect a status for the railroads so relinquished as favorable as that which they enjoyed during the three-year test period, great care will be taken to see that the railroads so relinquished are given fair divisions of joint rates, are insured a reasonable car supply—circumstances considered—and are protected against any undue disturbance in the routing of traffic."

The short lines had been particularly affected by the difficulty in making financial arrangements because of the uncertainty as to whether the government had taken them over and as to whether their earnings were to be guaranteed, and also by the diversion of their traffic in many instances to the trunk line railroads. They were also affected indirectly by the wage increases ordered by the director general and they

were not given the same advantages as to priority in materials and supplies that were accorded the railroads in the government system.

In order to secure a measure of protection a committee representing the short-line railroads entered into negotiations with representatives of the Railroad Administration for a contract which would make them certain guarantees, but without any provision for compensation by the government, and after two or three months of negotiations the director general offered the short lines a form of contract under which the roads were to be restored in a sense to federal control, but were not to be included in the government railroad system. An earlier form of contract offered by the Railroad Administration was rejected by the short line committee, but after some modifications had been made it was accepted by the committee of the American Short Line Railroad Association and recommended by it to the individual companies.

This contract, approved by Director General McAdoo on October 25, was published in the *Railway Age* of November 1, page 778, together with an account of the short-line situation. It provides that the roads are to remain under the management and direction of their owners, entitled to all revenues and responsible for all expenses, that joint rates

shall be divided on the basis in effect on January 1, 1918, and that such arrangements shall be made for the routing of competitive traffic as will guarantee to the short line the same amount of competitive traffic as was enjoyed for the average of three years ending December 31. The short lines were to have the benefit of the purchasing agencies of the director general and were to receive an equitable allotment of cars and motive power.

This form of co-operative contract, as it is called, has been signed by the director general in the case of the following railroads:

Cumberland & Manchester.
Eastern Carolina.
Georgia Northern.
Pecos Valley Southern.
Missouri & North Arkansas.
South Georgia.
Western Allegheny.
Midland Railway.

No definite list of the railroads relinquished has ever been given out by the Railroad Administration, but a list has been made of 753 railroads operating 27,319 miles, or an average of 36 miles each, which have not been included among the roads operated by the Railroad Administration, and exclusive of the industrial or plant facility roads.

Has Locomotive Standardization Been Justified?

Better Results Would Have Been Obtained Had the Roads Purchased Their Own Power

ONE OF THE MOST RADICAL innovations instituted by Director General McAdoo in his year's control of the railroads was that of establishing 12 standard designs of locomotives to be purchased for the railways under the jurisdiction of the Railroad Administration. This was done against the better judgment of a large majority of both railway men and locomotive equipment manufacturers and despite the fact that the President in his message to Congress said that, "Nothing will be altered or disturbed which it is not necessary to disturb." The proclaimed purpose for entering upon such a program was to provide new locomotives quickly, at as low a cost as possible, and to reduce to a proper minimum the classes of locomotives to be ordered for the railroads under government control. With the backing of but few friends, among them an officer of a locomotive building company and a railroad officer, the director general on February 13 requested S. M. Vauclain, vice-president of the Baldwin Locomotive Works, and chairman of the Committee on National Defense, one of the champions of standardization, to appoint a committee of locomotive builders to consider this problem and report within the week.

This was done and on February 19 this committee made its report to Mr. McAdoo, part of which was printed in the *Railway Age* of April 26, page 1085, in which it was stated that: "While it may be said, and truly so, that these standard designs could be rushed out quickly and the building of locomotives from them accomplished within a few months, if this is done, the factors just mentioned (providing the greatest interchangeability with existing equipment) cannot be taken into consideration within the limitations of time given and effort would have to be directed towards standardizing the details among these new types proposed without any reference to the standards now in use. This, in our opinion, would not be advisable, and we feel that the proper execution of such a series of standard designs cannot be carried out in time to permit the building of any of these locomotives for 1918 delivery. As the builders now have a

considerable amount of untaken capacity for this year we would respectfully suggest that if it is your desire that this year's full capacity (of the locomotive builders) be utilized, the railways be permitted to order for quick delivery, or until these standard designs can be properly worked out, such locomotives as they require exact duplicates of those now in service on their lines."

This part of the report passed unheeded and on February 22 a committee made up of railway mechanical officers, under H. T. Bentley, superintendent motive power of the Chicago & North Western, as chairman, met—not to consider the practicability of standardization—but to proceed with the work of preparing designs for the 12 different classes of locomotives that have since been ordered. The entire preparation of these designs was under the immediate direction of Henry Walters, chairman of the Atlantic Coast Line and the Louisville & Nashville, and special representative of the director general.

Early in April the work had progressed sufficiently for the preparation of tentative general specifications, which were sent out to the various roads with the request that they indicate the number of the different types they would care to have allotted to them. On April 30 an order for 1,025 of these locomotives was announced. During all this time sentiments were expressed by both railway men and equipment manufacturers against such an extreme policy, particularly while the nation was at war; these were published both in the columns of the *Railway Age* and the daily press.

If, by chance, the general plan of locomotive standardization was in any way practical for the railways in this country, the plan would have to be followed a large number of years in order to in any way justify it. This indicates that the director general had a firmly fixed idea that the railways would remain under the control of the government, if not permanently, for a considerable length of time. This thought was also made more evident by the manner in which the order for the first 1,025 locomotives was distributed be-

tween the American Locomotive Company and the Baldwin Locomotive Works—so that each company would have some of each type to build and thus be prepared to meet future orders—which was done at a sacrifice of speed in production. Conditions as they exist today, however, indicate that complete government control will soon cease—regardless of the fact that the director general is so actively backing the five-year extension plan—and shows what a long chance the Railroad Administration took in its endeavor to institute such a radical program. The accredited aims which the director general sought in establishing these standards, namely, quickness of delivery and low first cost, have not been realized. In fact, the order for 1,025 locomotives announced April 30 and which was added to later, making a total of 1,430, has only been about half completed, even though the locomotives were specified for 1918 delivery. While comparable information can hardly be obtained regarding the first cost, it is apparent that had the suggestion of the builders' committee been followed and those roads needing locomotives most been permitted to order existing designs, the costs of manufacturing incidental to new designs would have been eliminated, much work saved and a greater output obtained. The standardization of locomotives as planned by the Railroad Administration was, therefore, not a war measure, but part of a definite plan to completely unify the railroads, and the speed of delivery which was so apparently necessary at the time was sacrificed in an attempt to work to that end.

Had the strongly recommended "liquid reserve" plan which involved one type of standard locomotive (Mikado) of a design to meet general conditions, been followed and the roads been permitted to order locomotives of an existing design and construction to meet their particular needs, undoubtedly the output would have been greater, the first cost lower, and the director general would have had less difficulty in getting the railroads to pay for the locomotives built.

Railroads Hesitate to Pay for Standard Locomotives

When the locomotives were ordered a statement was made that they would be allotted upon completion to the various railroad systems where they were most needed and that they would be lettered "U. S." and remain the property of the government during its control of the roads. Thus at the beginning, the impression was general that the roads were to be provided with locomotives and that the statement of the number of each design needed to meet their requirements for new locomotives, which was requested when the tentative specifications were issued, was not a direct order on the government for them. In fact the roads were not permitted to place individual orders with the locomotive companies and were forced to take the standard locomotives if they were in need of new power. The Toledo & Ohio Central contested the right of the Railroad Administration to make it pay for the standard equipment and the matter is now in the courts.

The roads cannot be blamed for not wanting to purchase the standard locomotives and be obliged to operate them when the roads are returned to their owners, particularly when these locomotives are not as well adapted to the particular needs as the locomotives of the road's own design. Furthermore, all of the standard locomotives will be a constant source of expense to the roads on account of the new design of detail parts which will have to be carried in stock.

Deliveries and Service

Up to the middle of December 368 light Mikado, 118 heavy Mikado, 72 eight-wheel switcher, 48 six-wheel switcher, 19 light Santa Fe and three heavy Mountain type standard locomotives, or a total of 628, had been delivered to the railroads. The Mikados and Switchers were the first to be delivered and on roads where they have been in service long enough to determine their performance to a fair degree, it has been found that in most cases they have given

good service. The chief criticism heard is that regarding the grates, grate rigging and front end arrangement. These details were made standard on all locomotives, regardless of where they were to go, and in many cases it has been found necessary to alter them to meet the local fuel conditions.

In the case of one road to which a number of the standard locomotives were sent, they were found to be inferior to the road's own locomotives of but slightly less tractive power, particularly in the amount of fuel used. This same road has had much trouble with the stoker equipment, which is of a different design from that used on the road's other locomotives. Engine failures have been caused on account of this, which have delayed traffic and necessitated the use of relief locomotives. The engines were held out of service waiting for repair parts with which to repair the stoker. If the road had had the privilege of specifying the equipment desired it would have ordered that with which its other locomotives were equipped and with which its engine crews were familiar and for which it had material in stock for repair parts.

On another road several standard locomotives were delivered almost before the road knew it was to receive them. They were delivered under their own steam and one arrived with the grates burned out. As all grates had to be changed, the engines had to be held out of service until the work was done. The rod packing used on these engines was of a different design from any used on that road, although other standard locomotives were equipped with packing that conformed to its standards. As no packing was sent with the engines, delays were caused until the road procured the proper packing for the engines. One of the engines met with an accident and as there were no spare parts and no drawings of the standard locomotive, a draftsman had to go out on the road to the engine and make a sketch of the parts needed for patterns and forgings to make repairs. This, of course, required holding the locomotive out of service for some time.

Repair Problems

As pointed out in our discussion of standard locomotives last spring, the problem of handling the repairs to these locomotives is no small matter, and taken in the aggregate, the extra cost for equipping shops for handling these locomotives—of an entirely new design—cannot be overlooked. It should, in fact, be added to the cost of the locomotives, as it is directly chargeable to the standardization plan. On the smaller lines this will be particularly noticeable. If standardization were to continue it would be from 10 to 15 years before any beneficial effects could be obtained from standard locomotives from a maintenance standpoint. Even after the government releases the control of the roads and the railroads have control over the purchase of locomotives, the tools, taps, dies, patterns, etc., will have to be carried in stock to maintain these standard locomotives. Thus, while the builder—if he builds nothing but standard locomotives during 1919—may find some advantages, the railroads will be at a disadvantage during the life of the engines. The disadvantage to the railroads is many times greater than the advantage that is to be gained by the builders. Moreover, locomotives should be designed from the standpoint of operation and not the convenience of the builder.

On one road in particular a complete set of patterns will have to be made for the standard locomotives assigned to it, as no part of the standard locomotives is common to that of its own locomotives. Grates were the first part to be considered, then the other details follow in order, pistons, cylinder heads, cylinders and parts, crossheads, driving boxes, shoes and wedges, ash pan castings, crown brasses, engine trucks, tender trucks and trailer truck brasses and boxes. The road manufactures all repair parts of grey iron and wrought iron and steel at its railway shops. Many fittings

are entirely different from those that have been used on that road for years, such as gage cocks, cylinder cocks, water gages, blower valves, angle and globe valves, lubricators, injectors and checks. There are twice the number of specialties on the standard engines as on the roads' standard locomotives, for which the vital repair parts have had to be ordered from the manufacturers. In addition to this, drawings for the locomotives will have to be purchased at a cost of between \$500 and \$600. As none of the locomotives have gone through the shops it is not possible to tell just what additional equipment will be needed there. Confusion will be caused the repairing forces due to the fact that they have an entirely new class of locomotive to handle to which they must accustom themselves. The material for repairs will have to be carefully watched as other locomotive equipment will not fit.

Design of the Locomotives

As to the design of the locomotives themselves, the standardization committee is to be congratulated on the work it accomplished in the short space of time allotted it for the work. Strong efforts were made to produce a modern locomotive in every respect and from the reports thus far received of the few Mikados and Switchers that have been in service long enough so that an opinion can be formed of their performance, these have been found to be of fundamentally good design. After adjusting the draft appliances and the grates to suit the local conditions they have been found to be free steamers and to have ample boiler capacity.

In most cases the road men like them, although on some roads objections have been made to the cab arrangement. The kind of special devices that have been applied to them, where they were different from those used on the particular road operating them, has caused the greatest trouble. While it was the desire of the Railroad Administration to apply the same specialties to each standard design of locomotive, it would have been more logical to apply the accepted specialties in accordance with the wishes of the roads that were to use the locomotives.

Of course, as has been repeatedly pointed out, no standards can be made to meet all conditions and they must at best represent a compromise in design. The force of this was felt particularly on those roads which use anthracite coal as fuel. On one road in particular, which was provided with standard locomotives, provision had to be made for burning soft coal even though all the locomotives on that road were anthracite burners.

The Present Situation

With about half of the first order of 1,430 standard locomotives to be completed and all of the second order of 600 to come, it would seem to be unnecessary for the Railroad Administration to place any further orders for standard locomotives, as by the time the present orders are completed the roads may be back in the hands of the private owners. Since, however, there is great need for new locomotives, it should allow each road to order such types and designs as are best suited to its particular needs. In fact, there is evidence that this is being considered by the Railroad Administration, for it is reported that five roads have been permitted to go into the market for locomotives of their own design; the Baltimore & Ohio and the Virginian for Mallet locomotives, the Philadelphia & Reading for locomotives having the Wootten type firebox, the Boston & Maine, as the standard designs do not meet its clearance limitations, and also the Kansas City Southern. Even though the Pennsylvania has been in need of locomotives, it has been permitted to build them to its own design. Undoubtedly more roads will seek to order locomotives to their own design as soon as some definite assurance is given as to when the government will relinquish its control of the roads.

The French State Railways in the War Years

Harold G. Villard in The Economic World

AS IS GENERALLY KNOWN, the State Railways of France belong in the main to two systems, the one, commonly known as the Ancien Réseau (Old System), constructed many years ago, and the other, known as the Western Railroad System (Chemin de Fer de l'Ouest), acquired from its private owners two or three years before the war. Of these two systems the Ancien Réseau has not been directly affected by military operations, though its traffic has naturally been increased by the war conditions. Parts of the Chemin de Fer de l'Ouest, on the other hand, have at times been interfered with by the opposing armies, though at the same time the movement of freight and passengers has been greatly augmented by the proximity of the system to the chief fighting area. For many years before the war, the old system of state railroads was notorious both for the inefficiency of its service and for the inability to earn even the interest on the cost of its construction. Before the Western System passed into the hands of the government it had been a prosperous property; but after its purchase by the state its operating costs rose, and it became a burden upon the French government, instead of a financial aid, as had been prophesied by the advocates of the purchase.

It is of interest to know how these two state railroad systems of France have fared during the war years. In a recent number of *Le Monde Économique*, Paris, the operating results of the roads for 1916 are given, together with comparative figures for 1915. It appears that in 1916 the receipts of the old system amounted to \$16,267,125, a gain of \$2,015,186 over the 1915 receipts. The operating expenses for 1916 footed up \$16,379,673, an increase of \$2,390,829 over those of 1915. The operating deficit for 1916 was accordingly \$112,547, the coefficient of operating expense in 1916 being 100.69 per cent, as against 98.15 per cent in 1915. To the operating expense of 1916, however, must be added fixed charges of \$3,798,343, or \$60,119 more than in 1915. Hence the total deficit incurred in the system in 1916 was \$3,910,891—this deficit being \$435,562 greater than that for 1915. The deficit in both years, of course, had to be made good out of the French treasury, and added *pro tanto* to the burden of the French nation in its war period.

The financial situation of the Western System in the first two years of the war may be summed up as follows:

Receipts in 1916.....	\$59,624,904
Increase over 1915.....	10,479,492
Operating expenses in 1916.....	57,083,699
Increase over 1915.....	11,480,140
Net earnings from operation in 1916.....	2,541,205
Decrease from net earnings of 1915.....	1,000,648
Fixed charges in 1916.....	25,731,115
Increase over 1915.....	408,038
Deficit in 1916.....	23,189,910
Increase over 1915.....	1,408,686
Expense ratio in 1916 (per cent).....	95.74
Expense ratio in 1915 (per cent).....	92.79

It will be seen, therefore, that the combined deficit of the two state railway systems in 1916 amounted to over \$28,000,000. Of course, the operating conditions are abnormal.

The five great private railway systems have been similarly affected. But in 1916, when the expense ratio on the old system of the state was over 100 per cent and that on the western system nearly 96 per cent the average expense ratio on the five private railway systems was only 71.37 per cent. It varied from 64.7 per cent on the Paris-Lyons-Mediterranean railway to 82.25 per cent on the Nord railway. The most productive part of the last-named system is in the invaded districts of France, so that its operating expense ratio is abnormally high. *Le Monde Économique* concludes by saying that the above figures form a telling argument against state ownership and operation of railways.



The North River, New York, from the Woolworth Building. Copyright by Irving Underhill, N. Y.

Opportunities for Railway Supply Exports

The Business Interests Must Have Co-operation of Both the
Government and the Bankers

By Samuel O. Dunn

Editor of the *Railway Age*

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ONE OF THE THINGS I have been doing since I arrived in Great Britain has been to seek information which may throw light on the outlook for the sale of American railway equipment and supplies in foreign countries, both during the period of industrial reconstruction which we have entered, and following the actual period of reconstruction.

It is well known that until the Great War in Europe began the sales of American railway equipment and materials in foreign countries were quite small. The leading countries of Europe, and especially Great Britain and Germany, not only supplied their own needs, but sold most of the railway materials which were exported to other countries.

During the war, however, these countries became unable even to meet their own requirements, much less those of other countries, also. In consequence, orders for locomotives, cars, and many specialties were poured upon America in a flood. Our own railways were not buying as largely as they normally had, and our manufacturers welcomed these orders, and filled them rapidly until our own country entered the war. Thus, a large export business in railway equipment and supplies was built up. These were years when the number of locomotives built in the United States for foreign railways was as great as the number built for American railways. The foreign buying of American made cars, railway specialties of many kinds and machine tools also was large.

How much of this business will our manufacturers be able to retain during the period of reconstruction, and also after the period of reconstruction? These are important questions for our manufacturers, for our railways, which will get whatever traffic our export business may afford, and for the American people in general, whose prosperity will depend in no small measure in the future upon our export business in manufactures.

In the short time I have been here, during which affairs in Great Britain, and indeed, throughout Europe, have been in a turmoil, I have got more impressions than detailed information. I feel sure, however, from what I have been

told on every side, that the impressions I have received would be merely deepened by the acquisition of more detailed information, and, therefore, I shall give the impressions now, hoping to supplement them later, if fortune is kind, with more actual information.

Great Demand for Equipment Supplies

The most outstanding point of all is, that the railways of all the world now need vastly more equipment and materials of every kind than they ever did before. We all know that the railways of America need many thousands of locomotives, many hundreds of thousands of passenger and freight cars, many millions of tons of rail, and other materials and supplies in proportion. They need them, not merely for new construction and permanent improvements—although a vast amount of new construction and of permanent improvements is needed—but to make good the deterioration of tracks, structures and rolling stock which has occurred within recent years, and especially during the two years since the United States entered the war.

The situation is, of course, much more acute in other countries, and especially in those which have participated in the Great War since its commencement over four years ago. No foreign soldier has set foot on the soil of Great Britain, except as a prisoner; but it is hardly an exaggeration to say that the railways of that country are four years behind their requirements for locomotives, cars and work on the permanent way. They are so far behind, because since the beginning of the war they have practically acquired no new equipment and have kept their expenditures for maintenance at the minimum physically possible. The British railways build in their own shops most of their own locomotives and cars. During the war, their shops—which in many cases have been enlarged—have been devoted mainly to the manufacture of munitions.

The government has recognized in a very substantial way the deterioration which has been occurring by granting the railways in addition to the guaranteed return on their capital an allowance of 12½ per cent in excess of their ordinary

expenditures for maintenance, which has been put into special funds to be used after the termination of the war in making up deferred maintenance.

The conditions in the various parts of the British Empire—Canada, Australia, South Africa, New Zealand, etc.—which have not been in the zone of hostilities, as well as in the neutral countries of Europe, such as the Scandinavian countries, Spain, Holland, Switzerland, and so on, have been somewhat similar to those in Great Britain. The same thing may be said of the South American countries. The belligerent countries outside the immediate zone of hostilities have had to use all their resources of men and materials to carry on the war; and the neutral countries have had to see their railways deteriorate because they could not get materials to keep them up.

Far worst of all, of course, has been the case of the countries on whose soil hostilities actually have been conducted. Belgium, France, Italy, Russia, Roumania, and the Balkan countries have not only seen all their railways deteriorate, but they have seen large parts of them actually destroyed—tracks torn up, bridges blown up, cars burned, etc.

Prior to the war the aggregate amount of new railway construction going on in the world was great, and afforded a large market for equipment and materials of every kind. It is hardly necessary to say that all over the earth the war has practically stopped railway construction, and thereby stopped the development of new territories and new resources which railway construction always causes, and which, under modern conditions cannot occur without new railway construction.

Neither the market for railway equipment and materials which now exists, nor that which in the near future will exist, can be said to be as large in proportion as the need of the railways of the world for new equipment and supplies. It would require a fabulous amount of new capital to finance all the needs of the world's railways; and the world's supply of capital has been greatly depleted during the war, and it will take years to replenish it. But it cannot be replenished without a vast increase of production for the purpose of industrial reconstruction; and no such increase of production can occur until the railways are put into condition to handle the things produced. Therefore, the reconstruction of the railways will be one of the first things undertaken in every country whose statesmen and business men understand the present economic conditions and necessities; and this should mean that there will soon be the largest market for railway equipment and materials that ever was opened up.

America's Great Productive Capacity

The railway equipment and supply manufacturers of the United States—I use the term to include all that make anything used in construction, maintenance, or operation—have, of course, a vastly larger productive capacity than those of any other country—probably under present conditions larger than those of any other two, or even four countries. If as large a program of railroad reconstruction, improvement and new construction should be entered upon at once in the United States as the welfare of the country demands, our railway manufacturers probably would have their hands pretty full for some time filling domestic orders. But, in view of the existing confusion and uncertainty in our railway field it may be that our railways will not for some time place enough orders to use all the capacity of our railway manufacturers, and that they will be able to take a large amount of business from abroad.

That they can soon get a much larger business abroad than they ever have had seems highly probable, if they will go after it right, and can get the right kind of co-operation from our government.

In dealing with the export field, it would seem that our manufacturers should be very careful to think not merely

of the present and immediate future, but also of the distant future. If they do not, one result may be that the more business they get during the period of intense reconstruction, the less they will get after that period is ended.

Relations of United States and British Empire

The two greatest powers of the world now, in point of area, population, natural resources, and manufacturing activity, are the United States and the British Empire. In the long run our export trade in railway equipment and supplies, and in everything else, is going to depend very largely upon the relations between the governments and peoples of these two countries. We can do more business, on the whole, with the British Empire than with any other country; and at the same time, the British undoubtedly will be, for years to come, our principal competitors for foreign trade. The way in which our competition with them is carried on will have a great influence upon the welfare not only of the peoples of our two countries, but upon the welfare of those of the entire world. Therefore, the governments of the two countries, each let us hope intelligently and fully representing the true interests of its own people, cannot too soon reach a clear understanding as to just how much and what kind of governmental stimulus and governmental restriction are to be applied to the business interests of the two nations in trading with each other and in competing for the trade of outside countries. The peoples of the two nations must not only trade with each other, but compete with each other; but their trade should be carried on in such a way as to promote the welfare of both, while their competition should be a friendly, open, honorable, sportsmanlike rivalry, and not be characterized to any degree by the dishonorable, underhanded, spy-ridden methods which were used by the Germans in pushing their foreign business before the war.

Now, as to the sale of American equipment and supplies to the railways within the British Empire, it would seem that the following will be about the situation: The efforts of the British government and British business men already are being energetically applied, and will be for some time thus applied, to filling their own plants with orders. Prior to the war, there long had been much unemployment in Great Britain. The British people live in fear that a return of extensive unemployment would result in a serious development of Bolshevism in these islands. Therefore, under the leadership of their government, they are going to try to provide employment for every person who wants it, and especially for their returning soldiers. This is going to be a herculean task, for their population is very large, and these islands are very small. They can only accomplish the task by developing manufactures of all kinds to the utmost, since manufactures can give employment to more people within a given area than any other line of industry. The manufacture of railway equipment and supplies is a branch of the iron and steel trade, and there has been during the war an immense increase of the capacity of the iron and steel plants of Great Britain. This increased capacity has been devoted principally to producing munitions. Besides the enlargement of private plants, the government itself had built several large plants at a cost of several hundreds of millions of dollars, some of which had hardly got fully into operation when the armistice was signed. Both the private and government munition plants must be, in so far as is practicable, converted to the uses of peace.

The government and the business men already are turning rapidly to the work, first of filling with orders for industrial products plants that are now in shape to make such products, and, second of converting to the uses of peace plants which as yet are adapted only to the service of war. The British railway companies, as already indicated, have large reserves which they can apply as soon as they can get the necessary labor out of munition works and the army to

building new cars and locomotives. The private manufacturers of locomotives and cars of Great Britain—who ordinarily get about 90 per cent of their orders from railways outside of Great Britain—already are in the field for orders, and will begin largely to increase their output of railway supplies and equipment as soon as they can get their plants converted to peace purposes and get enough labor.

The chief railways for which equipment and supplies have in the past been made in Great Britain may be roughly divided into the following classes: First, the privately-owned railways; second, the state-owned railways of such colonies as those of Australia and South Africa; and third, railways in foreign countries which have been financed principally by English capital, such as several of those of Argentina. It seems pretty certain that the manufactures of other countries, including those of the United States, will not stand a good chance of getting very much business from any of these railways until the manufacturers of Great Britain are busy and labor has as much employment as the manufacturers can give it.

However, the railways mentioned have a large mileage and large needs. In spite of the great expansion of the iron and steel trade, it does not seem probable it could within any reasonable time supply all the requirements of these railways. Therefore, it would appear that the time is not far distant when many railways within the British Empire, and railways outside the Empire which are controlled by British capital, will turn to America to buy equipment and supplies.

The prospect of soon developing a large export trade in railway equipment and supplies with the other countries which have been belligerents in this war seems much better than that of the prospect of soon developing such trade with the British Empire. The British and Americans ought to be able between them to get most of the business which formerly went to the Germans. Now, since the surplus capacity of our manufacturers in the United States is greater than that of the manufacturers of Great Britain, we should be able, it would seem, to get more of this business than they. In the neutral countries our manufacturers certainly stand as good, or a better, chance as the British.

Must Comply With Foreigners' Wishes

It already has been intimated that in seeking this business our manufacturers should think not merely of the present, but even more of the future, provided they wish to build up a permanent foreign market for their trades. One of the most important points to be considered is that European designs and methods of manufacture have differed widely from those of America. There are many people in the United States who believe that because, within recent years, our manufacturers have succeeded in selling to foreign railways large quantities of equipment and materials, made according to American designs and standards, they will be able to continue to do so. Undoubtedly the familiarizing of foreign railway officers with the actual service of American products will have this tendency. There are very many things, however, that the foreign railway officer wants made in accordance with his ideas, rather than in accordance with those of the American manufacturer. Now, during the period of reconstruction, while the demand for railway supplies will be so great, the American manufacturer may be able largely to succeed in forcing the foreigner to take what the American wants him to take; but if he does, he is likely to find that when the demand declines the foreigner will turn to some British or German manufacturer who will make him what he really wanted all the time, and the American export trade will have made a merely temporary customer instead of a permanent one.

One of the marked characteristics of railway equipment and materials manufactured in Europe, and of many other

things for that matter, is that it is more finished than American manufacture ordinarily is. The European not only wants his locomotive, for example, to work well, but he wants it to look well. Therefore, he hand-works and finishes and polishes every part of it, and then paints it with bright colors. Now, whether American manufacturers like it or not, they probably must recognize the fact that if they are to capture and hold foreign markets they must indulge the taste, not merely of the European, but also of the South American and many other people for this kind of thing.

The great objection of American manufacturers to meeting foreign demands as to design, finish, and so on, is that it interferes with the quantity production which appeals so strongly to America. Perhaps a compromise of some kind can be struck, but it seems highly probable that large American manufacturers, in order to get and hold foreign trade, will have to set aside parts of their plants, or even establish separate plants, in which special machinery will be used and specially trained workmen will be employed, to make things as the foreigners want them made. It goes without saying that this would increase the cost of production; and how costs of production in the different countries will compare after such questions as those of wages and the distribution of raw materials are settled under peace conditions is still a matter of conjecture.

Some Things We Can Sell Abroad

A very large number of bridges has been destroyed in all the countries in which actual hostilities have been carried on; and America should be able to replace many of these. American bridges have established a good reputation throughout the world; and it is not so necessary to construct them according to foreign ideas of good practice.

That countries throughout the world will go to the United States for rails seems certain. The American makers of track fastenings should be able to get a large business in Spain, Portugal, France, Italy, and other countries, but they must be willing to make them to metric dimensions, and to meet foreign specifications. There will be a large market in Europe and elsewhere for American-made springs; but I gain the impression that if American manufacturers are to hold a substantial business in Europe they must follow European practice, even if they have to provide separate plants for the purpose.

Success of American Machine Tools

One of the great successes in Europe during the war has been made by American machine tools. There is no question that in the making of machine tools America leads the world. "Imitation is the sincerest praise"; and there are two or three concerns in Great Britain which are giving American machine tools this high praise by copying them without saying anything about the fact that what they are making are copies. How American tool makers will be able to meet this unfair competition is conjectural. It would appear, however, in view of the wonderful results obtained with our machine tools during the war, that our manufacturers should be able to build up and hold an immense foreign trade, especially if they can eliminate unfair competition such as that mentioned.

Talk of Electrification of Railways

There is much talk of electrification of railways in Europe. This has been suggested as one means by which British railways might be able to enlarge their capacity and reduce their expenses without increasing their structure gages.

The most important project for electrification which is receiving serious consideration is on the state railways of Belgium. The railways of that country have lost a large share of their rolling stock and have been largely destroyed. Since they must be so largely rebuilt, it seems to have been

concluded by their management that in the long run the most economical and progressive thing that could be done would be to reconstruct them for electrical operation practically throughout. Apparently, the plan adopted would be that of erecting large power-houses near the coal fields. Indications are that there will be a large development of the manufacture of electrical machinery and apparatus in Great Britain, and sentiment evoked by the war probably would tend to give British manufacturers a prior claim upon business in Belgium; but American manufacturers surely would have a good chance to get some of the business.

There probably will be an extensive reconstruction of block signals on European railways and American makers of signal apparatus and supplies should stand a very good chance to get a large part of this business. It is well-known that the automatic signal system, whose operation involves the use of much less labor than the manual controlled system, has been developed almost entirely by American inventors and manufacturers; and it would appear that there should soon be a large foreign market for automatic signal apparatus and supplies.

Many years ago when Lord (then General) Kitchener desired to make his famous advance upon Khartoum to rescue General Gordon, he needed practically to build and equip an entire railway line within a very short time. He asked the British builders to furnish him quickly a number of locomotives and cars, and also some bridges. The British replied they could not fill the order within so short a time. He then applied to America, and our manufacturers started the locomotives, cars and bridges to him within 30 days. It was a great achievement. Unfortunately, those locomotives and cars were kept in service on the railways of Egypt for years afterward, alongside equipment built in England. Having been turned out so quickly, they inevitably presented a very poor appearance, and gave a rather poor service compared with the English-built equipment, with its excellent design, fine lines and perfect finish. The railway men in Egypt soon forgot the circumstances under which the American equipment was built, and, in consequence, it became a permanent obstacle to the sale of additional American locomotives and cars in Egypt.

The lesson suggested by this incident does not require elaboration. There undoubtedly will be a large demand for American locomotives and cars and for various specialties used upon them, during the period of reconstruction. But whether they will in future years be a good or a bad advertisement of American manufacturers will depend upon how they are built. There is no question that American builders can do work that satisfies the foreigner. For a few years before the United States entered the war our builders were engaged more or less in making equipment for railways in accordance with foreign design—for example, for the railways of India, some of the standard designs of which were copies—and the results were very satisfactory. After the United States entered the war, however, the American government took the view that this interfered with quantity production; that quantity production was the thing most needed; and since then locomotives for export have been built chiefly according to American standards. Now, undoubtedly, for the good both of the foreign railway and the American manufacturer, the former should be educated gradually to accept American standards; but until education has done its perfect work, it will probably be good business to let the foreigner have very largely what he wants.

Financing Railway Construction Abroad

One of the great countries in which extensive work of reconstruction will have to be done is Russia. Her railways are in deplorable condition, and she needs a vast additional mileage of railways to enable her to develop her great natural resources. Her situation and her standards of railway con-

struction seem to make her much the most promising market in Europe for American railway equipment and materials; but it is to be feared it will be some years before she will have the stable government and the financial conditions which will make her a safe customer with which to do business. In entering the Russian market, it will be very important to enter through Siberia and to work harmoniously with the Japanese, who have a great influence in the Orient.

It cannot be too strongly emphasized that in the promotion of foreign trade of all kinds the business men of America must have the cordial support and the intelligent and friendly co-operation of their government. They must also have the support and co-operation of their great banking interests. The great export trade of Germany and Great Britain in railway manufactures is largely owing to the fact that their financiers have invested capital in foreign railways and then used their influence to cause the railways in which they have made investments to buy their equipment and materials from the manufacturers of their home countries. Of course, American financiers cannot be expected to make large investments abroad unless they can be made to feel reasonably sure that their government, in case of need, will help to protect their investments. There are vast parts of the earth, especially in Eastern Europe, Asia—particularly in China—Africa and South America, where the construction of a large mileage of new railways is needed. If American capital builds railways in these parts of the world, these railways naturally will go to America for materials for their construction, and also for equipment and materials for their subsequent operation and maintenance. American manufacturers of railway equipment and materials doubtless in any event will get a large amount of foreign business for some years; but in the long run they probably must look to the construction of railways in foreign countries by American capital to afford them the largest part of their permanent market abroad.

Hundreds of tons of high explosives, including T. N. T., the property of the French and Italian governments, has been towed out to sea from South Amboy, N. J., and dumped overboard 35 miles from Scotland Neck lightship. This was done by order of the Railroad Administration, in order to get the dangerous stuff out of the hands of the railroads. Two hundred and twenty-eight carloads had been stored at Wilmington, Del., for some time, awaiting disposition, and the residents of that city had become nervous for fear of disaster. Some of the material was removed to interior points designated by the French government.



With the Czecho-Slovaks in Siberia

More Railway Lines Abandoned Than Built

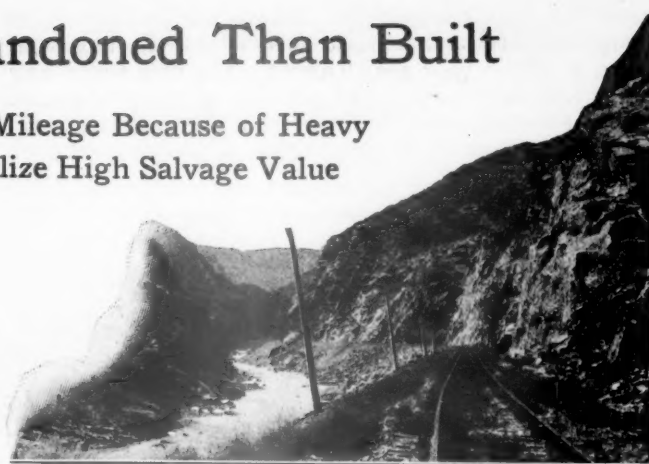
Operation Discontinued on Large Mileage Because of Heavy Expenses and Opportunity to Realize High Salvage Value

FOR THE SECOND TIME since the construction of the railway system of the United States was first undertaken in 1831, more miles of main lines have been abandoned in a year than have been built. The only other year in which this condition existed was in 1917. In 1918, 445.83 miles of main lines were abandoned permanently and taken up, 512.68 miles additional were abandoned permanently but have not yet been taken up, and 224.37 miles were abandoned for operating purposes for the period of federal control owing to the consolidation of parallel lines. A total of 1,182.88 miles of main lines has therefore been abandoned for operating purposes during the year which has just closed. This is considerably in excess of the mileage of new lines built as indicated in another article. A total of 200.32 miles of main lines has also been abandoned in Canada, this mileage being confined to the Pacific Coast extensions of the Canadian Northern and the Grand Trunk Pacific in Western Alberta and British Columbia, where joint operation was instituted, in this way releasing considerable quantities of track materials for military use on the French front.

A decrease in the mileage of railway lines in operation in the United States for two successive years does not necessarily indicate that this country is oversupplied with railways or that there are no further large areas needing transportation facilities. Rather, these statistics are a striking commentary on the conditions through which the railways of the United States have been passing in recent years. The refusal of the state and national commissions to permit rates to be increased commensurate with the rising costs of operation have forced many of the smaller and weaker lines into bankruptcy. Obviously the first roads to go under have been those in sparsely settled areas or with light traffic. Under those conditions banks have been reluctant to advance the funds necessary for the reorganization and rehabilitation of the properties, and, being unable to operate at other than a loss, there has been no alternative for them except to suspend operations. Even under these conditions the state commissions have, in most instances, refused to permit the abandonment and taking up of the lines and it has been necessary for the owners to go into the courts to secure the necessary authority after proving their inability to operate successfully.

The abandonment of these lines has received a decided impetus during the last two years. Costs of operation have risen rapidly on the small roads as well as on the larger systems. When the government took over the roads a year ago no distinction was made between the large and small lines in the President's proclamation. However, the Railroad Administration soon showed an unwillingness to assume financial responsibility for the operation of many of these smaller lines which were not essential to a unified national transportation system and a large number of them were turned back to their owners shortly before July 1. Facing the increased costs of operation brought about by the war, supplemented by the wage advances granted the employees on the roads under federal control, confronted with the diversion of traffic to the government-operated lines, and with little or no relief through increased rates, the owners of many of these properties have abandoned hope and shown a disposition to dispose of the roads for what they could secure.

Another condition leading to the abandonment of weak



roads has been the high prices which have prevailed for second hand materials. The shortage of railway supplies, and particularly of steel, raised the prices for many second hand materials to the point where they could be sold for considerably more than their cost new. In a number of instances this has resulted in the junk value of lines being greater than the amounts actually paid for them several years previous. Naturally, therefore, the owners of roads who were contemplating their abandonment in the near future have hastened to take advantage of these conditions to secure the highest possible return from their properties. The conclusion of the war, with the probable early return of the material market to a more nearly normal condition, will largely remove this latter incentive.

The statistics of lines abandoned this year also include a new factor. In working out the details of the policy of unified control of the railways of the United States as a single system the Railroad Administration has found it possible to co-ordinate the facilities of parallel lines in numerous instances. In some cases parallel single track lines have been converted for double track operation. In other cases one line has been abandoned and the traffic of both roads concentrated on the other line. This accounts for the 224.37 miles of lines reported as abandoned in the third column of the table accompanying this article.

Although it is in the far west that the greatest need for transportation facilities exists, it is in this same area that the largest mileage of lines has been abandoned.

The longest line on which operation was abandoned during the year was the Colorado Midland, extending from Divide, Colo., 194.20 miles to New Castle. Operation of this road ceased on August 1 and plans were made for its dismantling before winter, but the Colorado Utilities Commission prevented the track from being removed and the matter is now in the courts. The next longest road to be abandoned was the Las Vegas & Tonopah, 117 miles long, in Nevada.

The longest line abandoned and taken up is the North Pole route, in Alaska, 90 miles, and the next longest line is the Wisconsin & Michigan, 52.8 miles.

In considering these roads which have been abandoned one should not lose sight of the fact that many other lines in operation in the United States are unremunerative, but, being parts of larger systems, which as a whole are solvent properties, they cannot be abandoned. Particularly in the mountainous states of the west, as in Colorado, many of the larger systems are handicapped by branch lines tapping mining regions of earlier days, but now largely abandoned or extending into areas for which there has never been a sufficient demand for railways to justify their construction permanently. If left to themselves such lines would be clearly insolvent and abandoned, but as parts of a larger

system they have constituted a drain on the earnings of the remunerative lines and the state commissions have in general refused to permit their abandonment. The time would now seem opportune to make a study of lines of this character in order to ascertain where they may be abandoned and to remove this drain on the railways before they are turned back to their owners.

Railroad Abandoned in 1918

United States	Lines abandoned permanently and taken up (Miles)	Lines abandoned permanently and not taken up (Miles)	Lines abandoned temporarily through consolidation during period of Government control (Miles)
Atlantic Coast Line—Sebring, Fla.....		.70	.....
Baltimore & Ohio—West Baltimore to Washington main track, 1.40 miles; Hansrote, W. Va., to Magnolia, third track, 5.85 miles; total.....	7.25	.....	.....
Oliver Junction, Pa., to Oliver, 0.54 mile; Moore's Junction, Pa., to Redstone Ovens, 0.27 mile; Youngstown Junction to Youngstown Works, 0.96 mile; between Ft. Hill, Ohio, and Walton, Ind., 1.45 miles; total.....		.....	3.22
Baltimore & Ohio Chicago Terminal—Part of South West Spur.....	1.10	.....	.....
Buffalo Creek R. R. at Buffalo, N. Y....	0.12	.....	.....
Bullfrog Goldfield—Beatty, Nev., to Rhyolite	3.70	.....	.....
Central of Pennsylvania—Bellefonte, Pa., to Mill Hall, 27.38 miles; branch lines, 1.36 miles; total.....		28.74	.....
Chicago, Milwaukee & St. Paul—Northfield, Minn., to Canon Falls, 13.8 miles; Rock Valley, Ia., to Hudson, S. D., 9.4 miles; Madrid, Ia., to Philadelphia, 3.00 miles; Cement Line in Milwaukee, Wis., 1.00 mile; total.....	27.20	.....	.....
Chicago & North Western—Near Palmer, Mich.	4.50	.....	.....
Chicago, Rock Island & Pacific—Colgate, Okla., to Lehigh.....	.....	.....	6.54
Chicago Union Station Company.....	0.70	.....	.....
Cincinnati, Findlay & Ft. Wayne—Findlay, Ohio, to Ft. Wayne, Ind.....	.....	.....	91.93
Cleveland, Cincinnati, Chicago & St. Louis—Near Zionsville, Ind.....	.....	4.80	.....
Colorado Midland—Divide, Col., to Newcastle	194.20	.....	.....
Cripple Creek & Colorado Springs—Colorado Springs, Colo., to Cameron.....	39.00	.....	.....
Cybur, Gulf & North Western.....	10.00	.....	.....
Deer River (formerly Carthage & Copenhagen)	8.75	.....	.....
Denver & Rio Grande—Sonora, Col., to Graneros	18.05	.....	.....
Short Spurs to mines in Colorado, 0.99 mile, and in Utah, 1.03 miles; total.....	2.02	.....	.....
Duluth, Missabe & Northern—Iron Junction, Minn., to Biwabik.....	.....	.....	15.37
Elk & Little Kanawha, Baggs, W. Va., to Shook	26.30	.....	.....
Escañaba & Lake Superior—In Michigan.	3.50	.....	.....
Garden Bay Railway—Garden, Mich., to Cooks Mills .....	.....	13.80	.....
Galveston, Harrisburgh & San Antonio, Blodgett, Tex., to Stella Junction.....	4.51	.....	.....
Great Northern—At Helena, Mont., 3.96 miles; Hanover to Lewiston, 7.69 miles; total .....	.....	11.65	.....
Greeley Terminal	3.00	.....	.....
Hauto to Nesquehonings .....	.....	4.07	.....
Houston & Texas Central—Waco, Tex., to Ross .....	.....	12.00	.....
Kansas City Southern—Kansas City, Mo.	1.04	.....	.....
Las Vegas & Tonopah—Las Vegas, Nev., to Beatty	117.00	.....	.....
Lehigh & New England—Howerton Junction, Pa., to Howerton.....	0.97	.....	.....
Lehigh Valley—Stockton Junction, Pa., to Roan, 7.66 miles; Shepton branch to Beaver Meadow Colliery, 1.85 miles; Hickory Run to Hickory Run Brick Works, 1.30 miles; from M. & H. Division to Morris Ridge Colliery, 0.58 mile; Austin Branch to Lawrence Colliery, 0.46 mile; part of Tomhicken Colliery branch 0.28 mile; part of Coleraine branch 0.12 mile; total.....	12.25	.....	.....
Packer No. 5 Jct. to Ashland, Pa.....	.....	4.07	.....
Liberty White—McComb, Miss., to Tyler-town	24.78	.....	.....
Maine Central R. R.—Waterville, Me., to Benton	2.26	.....	.....
Meridian & Memphis—A. & V. Jct. to Meridian, Miss.....	.....	3.00	.....

Missouri, Kansas & Texas of Texas—San Marcus, Tex.....	1.15	.....	.....
Mobile & Ohio—on Blocton Branch.....	1.07	.....	.....
Montpelier & Wells River—Montpelier, Vt., to Barre.....	3.81	.....	.....
New Orleans Terminal—At New Orleans	0.99	.....	.....
New York Central—Cardiff Junction to Cardiff, Ill.	3.48	.....	.....
New York, New Haven & Hartford—Northampton, Mass., to Shelburne Junction, 18 miles; South Deerfield, Mass., to Turners Falls, 9 miles; total.....	27.00	.....	.....
Norfolk & Western—Lucas, Va., to end of Periwinkle branch, 2.81 miles; Blackstone, W. Va., to end of Blackstone branch, 5.52 miles; total.....	8.33	.....	.....
Northern Pacific—Groningen, Minn., to Banning	4.42	.....	.....
North Pole Route—Alaska.....	90.00	.....	.....
Ocilla, Pinebloom & Valdosta, La., Ga., to Leliaton	14.00	.....	.....
Olympia & Owingsville—Olympia, Ky., to Owingsville	6.80	.....	.....
Oregon—Washington—Black River Junction, Wash., to Argo.....	6.11	.....	.....
Ozark Valley Ry.—Williamsville, Mo., to Cascade	35.00	.....	.....
Pere Marquette—Carters to Honor, 5.13 miles; Spencer, Mich., to Kalkaska, 7.01 miles; total.....	12.14	.....	.....
Portland & Southeastern—In Arkansas..	22.00	.....	.....
Richmond & Rappahannock River—Richmond, Va., to Seven Pines.....	25.52	.....	.....
Seaboard Air Line—Between Atlanta, Ga., and Birmingham, 14.55 miles; between Archer, Fla., and Earlybird, 1 mile; total	15.55	.....	.....
Southern Railway System—From M. P. 418 to 420, 1 mile; M. P. 424.6 to 426.3, 1.7 miles; Blacksburg, S. C., to Gaffney, 0.31 mile; Gaffney to Cowpens, 0.25 mile; Cowpens to Mt. Zion, 0.75 mile; M. P. 490 to 492.3, 2.27 miles; Central, S. C., to Tugalo river, 17.2 miles; Tugalo river to Cornelia, Ga., 8.5 miles; total.....	31.98	.....	.....
From M. P. 423.8 to 424, .20 miles; Cowpens, S. C., to Mt. Zion, 1.37 miles; Central, S. C., to Tugalo river, 12.5 miles; Tugalo river to Cornelia, Ga., 5.2; total.....	19.27	.....	.....
Southwestern Railway—Henrietta, Tex., to Archer City	29.07	.....	.....
Traverse City, Leelanau & Manistique—Traverse City, Mich., to North Port... ..	29.20	.....	.....
Wabash Railway—Albia, Ia., to Tracy... ..	20.00	.....	.....
Western Maryland—From End of Jackson branch eastward, 1.73 miles; West of Lanacoring, 0.72 miles; total.....	2.45	.....	.....
Narrows Park, Md., to Mertens.....	8.00	.....	.....
Wichita Falls & Northwestern—Friederick, Okla. ....	.65	.....	.....
Wisconsin & Michigan—Aragon, Mich., to Faithorn Junction, 7 miles; Constine, Wis., to Everett, Mich., 31.8 miles; Peshtigo Harbor, Wis., to Bagley Junction, 14 miles; total.....	52.80	.....	.....
Total	445.83	512.68	224.37
Canada			
Canadian Northern—In British Columbia.	94.00	.....	.....
Grand Trunk Pacific—Lobstick Junction, Alta., to Red Pass Junction, B. C.....	106.32
Total	200.32



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Back in "Old Blighty"

A Shipper's View of the Railroad Problem

Opposes Government Ownership or Operation. Suggests
Larger Powers for Central Regulating Body

By F. B. Montgomery*

IN COMPLYING with the *Railway Age's* request for an expression of my views regarding the disposition of the railroad problem, I will say at the outset that I am opposed to government ownership and government operation. I shall not enter into a discussion of the merits and deficiencies of railway nationalization further than to say that neither my observation of federal control in this country nor my knowledge of government ownership as it has worked out in other lands, has convinced me that private operation is an economic anachronism. In this connection it should be borne in mind that a shipper's interest in transportation begins and ends with service rendered; he will espouse any scheme of operation which, in his estimation, will produce maximum results with a minimum of expense. It is therefore significant that after eleven months of practical experience with government operation the leading shippers' organization unanimously adopted a resolution in its annual convention condemning both federal control and ownership and recommending the early return of the railways to their owners.

Assuming that the carriers revert to private operation, the question arises whether they should return to the conditions which obtained previous to the war or whether some modifications should be made in their organization and in the laws governing them. Opinions on this subject are diverse. My own ideas, which follow, are subject to change as I give the matter more intensive study, and I wish it to be understood that they represent my personal views only, and in no sense indicate those which may be taken by the company which I represent, or the National Industrial Traffic League, of which I am a member.

Competition between railways is a desirable economic condition and should be re-established. The larger trunk lines, however, should have the right to purchase and consolidate adjacent and connecting short lines and roads which are not self-supporting—subject to the approval of the Interstate Commerce Commission. The carriers should be insured rates which will produce a liberal return on the value of their property with a surplus not exceeding four per cent annually. By a liberal return I do not mean revenues which will place badly managed, poorly located or over-equipped lines in the profit-producing class. Lack of foresight and business ability should be penalized in the transportation field as it is in other industries. The practical effect of giving weak roads a generous return would be to allow excessive profits to the strong lines.

The Act to Regulate Commerce should be amended to give the Interstate Commerce Commission full authority over capital issues of every kind; plenary power to authorize and regulate the pooling of equipment of all kinds, the joint use of terminals and other facilities; control of maintenance work in every detail with authority to determine the extent of the work which shall be done and the expenditures which may be properly made therefor; the right to authorize or veto the construction of new lines, or the extension of old ones, after weighing their merits from the standpoint of public necessity and convenience; authority to order augmented or

reduced transportation service as the needs of the public may dictate.

The railways should retain the desirable features of unified operation brought about by government operation. Both passenger and freight train mileage should be reduced to a point not beyond the necessities and requirements of the public. There should be further consolidation and enlargement of freight trains when in the interest of economy and service. Through routing should be encouraged to reduce delays and congestion in break-up yards. Heavy loading of equipment is likewise an operating principle which has come to stay, but, it should not be observed to the extent of delaying the movement of shipments which should be handled expeditiously on account of commercial necessity. The joint ticket offices which have been established in the large cities of the country are undoubtedly a great convenience to the public and will probably be retained for that reason although they are of doubtful economy.

Those portions of the commerce act should remain unchanged which give the Interstate Commerce Commission the authority to suspend tariffs which place upon the carriers the responsibility of justifying rates of, and grant to shippers the right to route traffic. Much has been said about economical routing since the director general gave the carriers the right to deviate from the routing instructions of the shipper. It is my conviction that in times of peace the shipper is much better qualified to route traffic than the railroads. Because of his intimate knowledge of the location of the consignee with reference to alternate lines, and the character of the unloading facilities of each—if plant delivery cannot be made—he is better able to route in such a manner as to insure delivery with minimum detention at unloading platforms or in interchange yards. A recent experience of the company I represent illustrates the results which accrue from interference in routing by railroads. A heavy tractor was shipped to a point in Pennsylvania and routed over a line which had special facilities for unloading the machine at destination. The car was rerouted over another road with the consequence that it had to be switched back at destination to the line originally designated, before the tractor could be unloaded.

Another feature of government operation which has been widely proclaimed as conducive to economy and improved service is the unification of terminals. Although I do not condemn joint terminal operation and, in fact, recommend its adoption to the extent that the Interstate Commerce Commission may deem economical, it has not yet been thoroughly tried out. The best of theories do not always work out satisfactorily in practice. In making this remark I have the experience of my own company in mind. Under former conditions shipments from our Deering plant would pass through the Chicago terminal district within 24 to 48 hours. At the present time, with the terminals under one management, the best time for like movements is 72 hours.

Another idea which seems to be quite prevalent among both railroad officers and shippers is that the power to regulate railroads should be taken from the state commissions, leaving the Interstate Commerce Commission the only regulatory body in the country. It is my conviction that the territory served by our railways is too large to warrant such a concentration of authority. Innumerable matters of local

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concern and of no consequence to the remainder of the country can be better settled by a state body, thereby relieving the national commission of much detail which would have to be handled from a distance. It should also be borne in mind that the police power of the individual states gives them the authority to regulate traffic moving exclusively within their borders and this cannot be taken away from them without an amendment to our constitution. But such radical action is not, in my opinion, necessary. Through the Shreveport case which defined the relation of interstate to intrastate regulation, the Interstate Commerce Commission has all the authority over state rates that it needs.

Dividend Changes

THE PRINCIPLE LAID DOWN in the President's proclamation taking over the roads, in so far as it applied to dividends, was the continuance of dividends at the regular rate where these dividends had previously been paid from surplus earnings. There is still some doubt and uncertainty, however, in regard to dividends, and the Baltimore & Ohio, Chicago, Milwaukee & St. Paul, and the Wabash are holding up their dividends, the first two pending a settlement of the contract with the government, and the Wabash pending a decision of the Administration.

The Baltimore & Ohio reduced its annual rate on the common stock in the second half of 1918 from 5 per cent, paid in 1917, to 4 per cent. Thus if the contract is signed with the government $4\frac{1}{2}$ per cent total will be paid out in dividends for 1918.

The Buffalo, Rochester & Pittsburgh reduced its dividend rate, the rate in 1917 being 6 per cent; while 3 per cent was paid in the first half of 1918, only 2 per cent was paid

The Buffalo & Susquehanna paid 7 per cent on the common in 1917 and a $1\frac{3}{4}$ quarterly dividend on the common in the first quarter of 1918, but in the remaining three-quarters, "at the behest of the Railroad Administration," declared quarterly dividends of $1\frac{1}{4}$ per cent each, making a total for 1918 of $5\frac{1}{2}$ per cent.

The Cripple Creek Central paid 6 per cent on its common stock in 1917 and $1\frac{1}{2}$ per cent quarterly for the first two quarters of 1918, but passed the dividend in the third quarter, making 3 per cent paid in 1918, according to the latest advices.

The Union Pacific, in 1917, paid regular dividends on the common of 8 per cent and paid $3\frac{1}{2}$ per cent extra dividends. In 1918, the stock was put on a regular 10 per cent dividend basis, although in the first quarter a regular dividend of 2 per cent was declared with a half per cent extra.

In the next and succeeding quarters the regular dividend was $2\frac{1}{2}$ per cent. Thus, the stock paid $11\frac{1}{2}$ per cent dividends in 1917 and 10 per cent in 1918. The Pittsburgh, Cincinnati, Chicago & St. Louis, a subsidiary of the Pennsylvania, reduced its annual dividend from 5 per cent, paid in 1917, to 4 per cent.

Operations of the Great Western Railway of England

THE GREAT WESTERN of England is the largest railway in the United Kingdom, its operating mileage being greater by a thousand miles than that of the next largest British railway. The Great Western serves an extensive territory, west, northwest, and southwest of London, including

GREAT WESTERN RAILWAY

Item	1913	1914	1915	1916	1917	Per cent of increase 1917 over 1913
Mileage:						
Miles of line.....	3,025	3,028	3,029	3,030	3,002	d 0.76
Main track.....	5,073	5,096	5,119	5,127	5,084	0.22
All tracks.....	6,645	6,695	6,743	6,766	6,706	0.92
Total Investment:						
Road and equipment.....	\$515,903,000	\$520,542,000	\$523,121,000	\$524,261,000	\$524,552,000	1.68
Other investment.....	33,391,000	33,603,000	33,590,000	33,665,000	33,635,000	0.73
Total.....	549,294,000	554,145,000	556,711,000	557,926,000	558,187,000	1.62
Income Account:						
Total operating revenues*.....	\$77,966,200	\$78,837,500	\$81,237,900	\$84,526,700	\$91,542,500	17.41
Total operating expenses.....	50,641,300	51,618,800	54,234,500	57,539,000	64,288,600	26.95
Net operating revenue*.....	27,324,900	27,218,700	27,003,400	26,987,700	27,253,900	d 0.26
Miscellaneous receipts.....	1,528,800	1,364,800	1,453,100	1,594,400	2,180,700	42.64
Gross income.....	28,853,700	28,583,500	28,456,500	28,582,100	29,434,600	2.01
Interest, rentals, etc.....	9,514,800	9,585,300	9,616,700	9,680,800	9,693,400	1.88
Dividends.....	18,388,200	18,089,000	17,647,400	17,647,400	17,647,400	d 4.03
Balance for year.....	950,700	909,200	1,192,400	1,253,900	2,093,800	120.24
Equipment:						
Locomotives†.....	3,090	3,104	3,104	3,131	3,147	1.84
Cars—total.....	92,346	92,448	93,252	93,979	94,423	2.25
Passenger cars‡.....	5,681	5,703	5,634	5,601	5,576	d 1.85
Other passenger-train cars.....	3,011	3,013	3,010	3,014	2,990	d 0.70
Freight cars.....	75,875	76,189	76,967	77,634	78,128	2.97
Company service cars.....	7,779	7,543	7,641	7,730	7,729	d 0.64
Train-miles.....	52,588,713	53,331,756	52,733,343	51,734,073	47,706,684	d 9.28
Passenger train.....	32,419,547	33,056,501	30,351,630	27,868,363	22,755,883	d 29.81
Freight train.....	20,169,166	20,275,255	22,381,713	23,865,710	24,950,801	23.71
Per cent passenger train.....	61.6	62.0	57.6	53.9	47.7	.....
Per cent freight train.....	38.4	38.0	42.4	46.1	52.3	.....

*Adjusted in 1914-1917 to correspond to the Government guarantee of net revenue. †Includes 20 electric motor cars throughout. ‡Includes 40 electric trailer cars throughout. d Decrease.

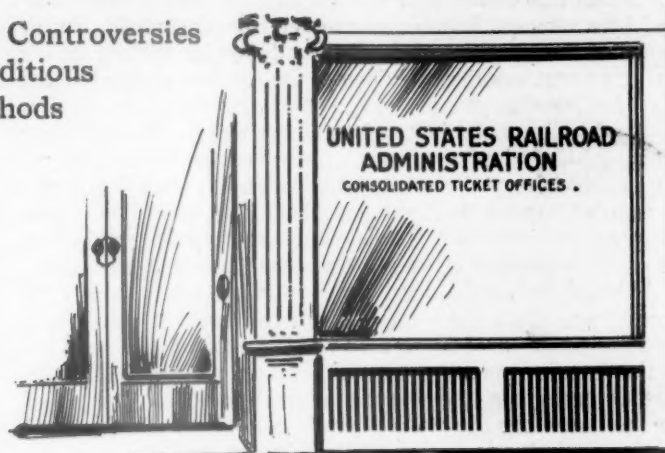
in the second half of the year; thus, the dividends paid in 1918 amounted to 5 per cent, but the stock is now on a 4 per cent basis.

The Alabama Great Southern in 1917 paid a regular dividend of 5 per cent and 2 per cent extra on the common, and a regular dividend of 6 per cent and 1 per cent extra on the preferred. In 1918, a semi-annual dividend of 3 per cent was declared on the common, for the first half year, and $3\frac{1}{2}$ per cent on the preferred, and in August no dividend was declared on the common, and 3 per cent was declared on the preferred.

the important cities of Birmingham, Bristol, Plymouth, Cardiff, Birkenhead and Swansea. A statement recently issued from the Great Western statistical department makes available certain information regarding its operations during the last normal year preceding the war (1913), and the first four years of the war period, (1914, 1915, 1916 and 1917). From this statement the statistics in the table have been taken by the Bureau of Railway Economics, as being of general interest to students of the American railway problem, and also as throwing light on the relative operation of British railways under normal and war conditions.

Radical Changes Take Place in Traffic Field

Slow Adjudication of Rate Controversies
Gives Way to Expeditious
Administrative Methods



NO DIVISION OF RAILROADING has been so radically modified by federal control as to organization and authority as the traffic department. The passing of competition proved the death knell of all solicitation of business. On the other hand, the rapidly rising costs of transportation during the war made increased revenues imperative, and these were secured not through the slow, cumbersome processes of the Interstate Commerce Commission and the state regulatory bodies, but promptly through a proclamation by the President. Under the authority conferred by the federal control act, the director general, acting for the President, initiated a freight rate advance of 25 per cent without hearings of any kind or referring the matter in any way to the interstate or state commissions. He knew that the railways needed more money and needed it immediately, so he proceeded to get it. At the same time that he increased freight rates he advanced passenger fares to three cents and authorized additional transportation charges for parlor and sleeping car passengers.

The original order, No. 28, provided that interstate rates should supersede state rates. As the result of strenuous protests by state commissions and others the intra-state freight rates were not cancelled but remained in force with the increase prescribed in the director general's order.

Realizing that General Order No. 28 was an emergency instrument and hence unavoidably imperfect, the director general created three territorial freight traffic committees and 25 district committees to iron out such inequalities and injustices as were contained in the order. He later authorized the appointment of representatives of the shipping public to membership on these bodies, so that no action would be taken without giving due consideration to the viewpoint of the railroad patron. This organization, under the director of the Division of Traffic of the Railroad Administration, practically replaced the Interstate Commerce Commission and the state commissions in rate regulation.

The same expeditious methods employed in securing increased revenues for the railroads were used to increase the returns of the American Railway Express Company. The operation of the company was taken over by the director general of railroads on November 18; two days later he issued General Order No. 56 announcing an advance in express rates, effective January 1, which is calculated to produce an increase in revenues of about \$24,000,000 annually.

Not only did the Railroad Administration advance its charges, but it saw to it that they were paid promptly. In General Order No. 25, which became effective on August 1, all transportation charges were put on a cash-on-delivery basis with the exception that credit is allowed under bond for 48 hours after sending a shipment, if prepaid, or after delivery at destination, if it be a collect consignment.

Through the unification of all the important lines in the country a more general introduction of uniform practices was obtained and railroad facilities and forces were more extensively pooled. Time tables and tickets were standardized, universal mileage scrip was introduced and interchangeable tickets were put on sale between certain large cities. Universal transit was established, *i. e.*, all existing tariffs which provided that outbound shipments from a transit point should pass over the road hauling the inbound were altered to permit movement over any line. Joint livestock agencies were created at the large western markets, and consolidated ticket offices have been opened in most of the large cities of the country.

From the standpoint of the shipper the very first general order was a serious invasion of his rights. It provided that the designation of routes by shippers was to be disregarded by railroads when speed and efficiency of transportation service may thus be promoted. While this action was prompted by the desire to remove all obstacles in the way of operating efficiency during the war, it deserves mention because it took from the shipper a prerogative which he long considered inviolable.

The importance of the traffic department as a railroad sales organization disappeared with the elimination of competition under government operation. Not only was all solicitation of traffic abolished, but all off-line traffic offices were closed. Although the Railroad Administration arranged that the informative work performed by these agencies should be taken over by resident lines, there has been considerable complaint on the part of shippers concerning the manner in which this service has been rendered since the change was made. The justice of their criticisms has been recognized by the director of the Division of Traffic and the regional directors who recently took steps to strengthen the traffic service departments of the railways. Exhaustive instructions issued by B. L. Winchell, Southern regional director, regarding traffic service work, were published in the *Railway Age* of December 13, page 1073. If these activities are carried on with the thoroughness suggested in Mr. Winchell's circular, it is doubtful whether the director general will be able to show any saving through the elimination of solicitation.

Other traffic activities discontinued under federal control were advertising and industrial development work. During the war when the rails were burdened with unprecedented tonnage it was not considered good policy to do anything which would tend to increase railroad traffic. It is understood that steps are now being taken to resume the stimulation of passenger traffic to some extent, and it is probable that the railroads will again take a leading part in the industrial expansion of the country. That the Railroad Administration

is planning to encourage passenger travel, which during the war was curtailed as far as possible, is further indicated by the recent restoration of a number of passenger trains which had been removed from service under federal control. In his report of the activities of the Railroad Administration during its first seven months of existence the director general stated that passenger service to the extent of 21,000,000 train miles a year had been eliminated in the territory west of Chicago and the Mississippi river, while in the eastern region the reduction in train mileage was equivalent to 26,420,000 per annum. Many of the trains annulled were superfluous, constituting duplications of service under competitive conditions. These will not be restored under government operation.

Although industrial development work was suspended during the war, the activities of the railroad agricultural departments were encouraged, as they were recognized as useful organizations in promoting a maximum yield of foodstuffs. To further strengthen the existing agricultural departments of the railways the director general created an Agricultural Section with headquarters at Washington and two agricultural committees, one for the North and West and the other for the Southeast, Texas and Oklahoma.

The director general's activities in the traffic field of transportation were not confined to emergency measures calculated to satisfy the demands of war conditions, but in some respects affected basic principles. Early in his term of office he ap-

pointed a special committee on uniform classification to formulate a report as to uniform rules, descriptions and weights with a view to completing that portion of the work. This body prepared Consolidated Classification No. 1, which has been the subject of hearings before the Interstate Commerce Commission at various cities throughout the country.

The director general has also proposed the standardization of class freight rates on a basis intended to eliminate the discriminations and inequalities resulting from differences between the rates of various States and between state and interstate rates and to bring about a greater degree of uniformity in those sections of the country where conditions of transportation, density of traffic and of population, etc., are similar. The plan, as submitted by the Railroad Administration to the Interstate Commerce Commission and the state railroad commissions, provides for a system of class rate scales, graded according to mileage, for adoption in all of the States except official classification territory, because the rates in that territory are already on a more uniform basis than in other sections of the country. Four scales are proposed, three of which are related to each other on a percentage basis. It is not probable that these scales will be made effective except after extended hearings before the various commissions. Nevertheless, some shippers have expressed the fear that the sole purpose of the plan is to effect a further increase in rates.

One Year of Government Control of Railroads

Radical Changes Possible Because of Autocratic Power Placed in Hands of Director General

IN THE ANNUAL REVIEW NUMBER of the *Railway Age* published a year ago, on January 4, 1918, there were recorded the first steps taken by Director General McAdoo toward co-ordinating the transportation facilities of the United States into a single system. We are now awaiting the appointment of a new director general of railroads, one of the most important of whose functions, it is believed in many quarters, will be to wind up the affairs of the Railroad Administration organized by Mr. McAdoo and to arrange for the restoration of the railroads to their owners at an early date.

Meanwhile Congress is beginning this week an inquiry into the railroad situation with a view to determining what ought to be the government's policy toward the railroads either now or permanently, an inquiry which will involve to a considerable extent the question as to how much of the policy adopted by Mr. McAdoo for a year during which the country was at war should be retained during times of peace. It seems to be generally accepted that if the railroads are returned to the management of their owners it will be under conditions differing greatly in many respects from those which formerly prevailed and that regardless of opinions as to the success of Mr. McAdoo's policy as a whole many lessons have been learned during the past year which will have permanent results.

A review of the manifestations of that policy and of what has been accomplished under it during the past year is, therefore, timely, but the various activities of the Railroad Administration have been so fully reported from week to week in our columns and a comprehensive official report prepared by the various departments and regional directors of the Railroad Administration is to be issued so soon that a detailed chronicle of events is hardly warranted at this time.

On June 17, after Director General McAdoo had been in charge of the railroads for over five months, he issued a

public statement declaring that the policy of the Railroad Administration has been informed and shaped by a desire to accomplish the following purposes, named in what he conceived to be the order of their importance:

The Policy of the Railroad Administration

First. The winning of the war, which includes the prompt movement of the men and material that the government requires. To this everything else must be subordinated.

Second. The service of the public, which is the purpose for which the railways were built and given the privileges accorded them. This implies the maintenance and improvement of the railroad properties so that adequate transportation facilities will be provided at the lowest cost, the object of the government being to furnish service rather than to make money.

Third. The promotion of a spirit of sympathy and a better understanding as between the administration of the railways and their 2,000,000 employees, as well as their 100,000,000 patrons, which latter class includes every individual in the nation, since transportation has become a prime and universal necessity of civilized existence.

Fourth. The application of sound economies, including:

- (a) The elimination of superfluous expenditures.
- (b) The payment of a fair and living wage for services rendered and a just and prompt compensation for injuries received.
- (c) The purchase of material and equipment at the lowest prices consistent with a reasonable but not an excessive profit to the producer.
- (d) The adoption of standardized equipment and the introduction of approved devices that will save life and labor.
- (e) The routing of freight and passenger traffic with due regard to the fact that a straight line is the shortest distance between two points.
- (f) The intensive employment of all equipment and a careful record and scientific study of the results obtained, with a view to determining the comparative efficiency secured.

While many students of transportation have formed a strong impression that Mr. McAdoo was also actuated by a desire to demonstrate that these purposes could be accomplished more successfully by the government than by private enterprise, it will be fair to endeavor to appraise the results of the year by the extent to which these objects have been attained, giving consideration to the fact that Mr. McAdoo undoubtedly had in mind a longer period than one year and that it could hardly be expected that the full results could be obtained in that period.

As the primary purpose of the government in taking over the railroads was to increase the efficiency of the trans-

portation system for the handling of the war traffic, the first question to be asked, in any analysis of the results of the year, naturally involves the volume of traffic handled. The statistics are available, in the monthly reports compiled by the Operating Statistics Section of the Division of Operation, for the 10 months ending with October, which nearly covers the period of war traffic this year, as the armistice was signed on November 11. For this period railroads operating 228,665 miles had handled a total of 365,855,394 net ton miles of freight (revenue and non-revenue), as compared with 358,977,441 in 10 months of 1917. This is an increase of 1.9 per cent. It is assumed that the real increase in traffic handled was somewhat greater than this figure indicates because one of the primary policies of the Railroad Administration has been to save ton miles by the rerouting of freight to avoid circuitous routes and cross-hauling, but the exact amount of this saving cannot be determined.

Increased Expenses

This record-breaking traffic was handled, however, at record-breaking expense, largely on account of the increases in the wages of railroad employees, the bulk of which were made effective for the entire year, whereas the rate increase was in effect for only six months. There have also been large increases in the cost of fuel and other supplies, and while the proportion of the increase attributable to these items is not known, the total increase in operating expenses for the 10 months ending with October 31, for which statistics are available, was \$903,000,000, an increase of 38 per cent, as compared with an increase in revenues, caused principally by the increases in rates, of \$607,000,000, or 20 per cent. While a large number of economies have been effected, such as those resulting from the rerouting of traffic, the reduction of passenger train mileage, the joint use of facilities in many places, the discontinuance of traffic solicitation and the charging of many salaries and other general expenses to the corporate accounts rather than to operating expenses, their amount has been so small as compared with the increases in expenses in other directions that they became appreciable only when segregated, at least so far as this year's experience is concerned. While various statements have been given out by the Railroad Administration from time to time of the estimated savings resulting from these various economies, in one or more regions at a time, they have not been grouped in such a way as to give any very definite idea as to their aggregate. Regional Director A. H. Smith, in a report covering the operations of the Eastern region, on August 29, mentioned economies amounting to approximately \$36,000,000 a year. Doubtless more comprehensive figures will be shown in the forthcoming annual report of the Railroad Administration.

The report made by Mr. McAdoo to the President on September 3 included an estimate of \$23,566,633 for the saving effected by the closing of freight and passenger offices and curtailment of advertising, but these reductions in expenses were not in effect throughout the year, and the Interstate Commerce Commission statistics for 10 months show a decrease in traffic expenses of only \$12,000,000. The report of September 3 also mentioned a saving of \$4,000,000 in salaries of officers, but the 10 months' figures show an increase of \$12,000,000 in general expenses, which indicates that the saving in officers' salaries has been more than offset by the increase in the wages of clerks, and other general office expenses. The increase in operating expenses includes \$138,000,000 for maintenance of way and structures, \$333,000,000 for maintenance of way and equipment and \$426,000,000 for transportation, and while the maintenance of equipment account probably includes more work than was done during the corresponding period of 1917, it is certain that the amount of work performed on the maintenance of way and structures, on account of shortage

of labor and materials, was considerably less than in 1917.

What the expenses would have been if the railroads had remained under private management during the past year of course can never be determined.

The efficiency of transportation involves not only the volume of traffic handled, but the expedition with which it is moved and the promptness and regularity with which cars are supplied. While this can hardly be demonstrated statistically, it seems to be generally recognized that the classes of traffic regarded as essentials during the war period, which constituted the bulk of the traffic moved this year, have been given remarkably good service and a special expedited service has been furnished in the case of many especially important commodities, such as food supplies, oil, and other articles which have been consolidated and moved in solid trains via the routes best fitted to handle the traffic from the west to the seaports, avoiding delays at intermediate terminals. While the Railroad Administration discontinued the publication of the statistics of car surpluses and shortages which have been compiled since 1907 by the American Railway Association, the weekly and monthly reports of traffic conditions which it has issued have disclosed only occasional and local car shortages since the early months of the year and in recent weeks considerable surpluses have been reported in various sections, particularly in the case of coal cars, of which there were large shortages last year.

Co-ordination of Government Departments

One of the most important ways in which the efficiency of the transportation service has been improved under the Railroad Administration, as far as the war traffic is concerned, has been the result of a closer co-ordination of the railroad service with the various other governmental war agencies and between our government and the representatives of the Allies. This was developed as the government gained organization experience after some unfortunate experiences in the earlier part of the war period, and the fact that the Railroad Administration was itself a government institution probably helped to promote harmonious relations. Better co-ordination of the government's traffic requirements was repeatedly urged by the Railroad's War Board last fall in order to prevent the confusion and congestion which resulted from the conflict of priority orders, but the War Board itself was not able to bring this about.

One of the first acts of the Railroad Administration after it had been organized was to appoint representatives of the Division of Traffic as traffic officers of the Food and Fuel Administrations, the War and Navy Departments, the War Industries Board and the War Trade Board. Thus, whereas priority orders had formerly been issued by 568 quartermasters in the War Department alone, the authority to issue such orders for the department was concentrated in the hands of the manager of inland traffic, and as the traffic officers of the various departments were able to work together, it was possible to carry out a general priority program without conflict and the prompt and preferred movement of war supplies was facilitated. It has come to be recognized that the congestion at the eastern seaports in 1916 and 1917 was caused by the unregulated shipment of export freight to a few ports regardless of the possibility of loading it into vessels, and it seemed impossible to increase the use of other ports because of lack of terminal facilities and because of the preference of the ships for certain ports, particularly New York.

This year the Railroad Administration perfected the permit system and the use of regulating embargoes to prevent the accumulation of freight at the ports, the government developed increased storage and handling facilities at numerous ports, the Shipping Board and the marine department of the Railroad Administration arranged for sailings from those ports and the Railroad Administration, after a study of traffic routing conducted by a special committee, ar-

ranged for the diversion of export freight to the ports where it could be handled, obtaining a much greater use of the southern and gulf ports. Later an exports control committee was formed to direct the routing of export freight and developed a zone system which greatly facilitated the regulation of this traffic.

The removal of the obstructive congestion which last winter almost paralyzed operations at some of the eastern terminals had a most vital bearing on the country's war efforts. So serious was the situation at one time that the late Lord Rhonda, food controller of England, sent a message to Washington saying that "unless America can increase the quantity of supplies I am unwilling to guarantee that the allied nations can hold out." Still later the representatives of the allied governments in Washington predicted disaster unless the shipment of food supplies was expedited and the centralized efforts of the Railroad Administration and its co-operation with other departments made it possible to meet the demands.

Coal Traffic

Until recently the coal situation has been regarded as one of the most critical factors limiting the productiveness of America's war machine, and particularly during last winter it was the occasion of bitter controversies as to whether the responsibility for insufficient production belonged to the railroads, the coal operators, or the Fuel Administration. One of the most urgent recommendations of the Railroad's War Board was the adoption of a zone system to eliminate cross-hauling and reduce the distances over which coal should be transported. While the railroad committee had no power to put its recommendations into effect, the plan which it had worked out was taken as the basis of the plan later adopted by a joint committee of the Railroad and Fuel administrations which has been credited by the Fuel Administration with saving over 160,000,000 car miles. Co-operation between the two administrations and the coal producers and consumers also made it possible to maintain a heavy traffic in coal during the summer months when operating conditions were most favorable, and up to December 31 the railroads had handled 624,628 cars more of coal than they handled in 1917, with practically no increase in the number of cars.

This is simply one illustration of the things that were made possible by the co-operation engendered by the war. In former years railroads have tried to get consumers to buy and producers to ship coal during the months of favorable weather, without much success, because the producers could not ship without being assured of a market and consumers were reluctant to order in advance or had little storage capacity. This year advance ordering became a matter of self-preservation as well as a patriotic duty.

Service of the Public

As to the second purpose mentioned by Mr. McAdoo in his statement, the service of the public in general, it must be admitted that the Railroad Administration during the past year has been less successful than in the handling of the war traffic, to which, of course, everything else was subordinated. Passenger service in particular has suffered in spite of many improvements effected in various ways in such matters as rearrangement of schedules, joint use of terminals, consolidated ticket offices and timetables and interchangeable tickets. Trains have been overcrowded and many privileges formerly accorded to the traveling public have been withdrawn. However, these conditions have been accepted cheerfully on the whole by the majority in the same way that various discomforts and inconveniences caused by the war in other ways have been accepted. There has been more complaint on the part of shippers regarding the loss of some of their privileges and because of the frequent disturbance of established conditions, while ship-

pers whose products were listed among the non-essentials have had little occasion to praise the service. Many representatives of the more essential industries have paid high tribute to the quality of the service accorded them.

As far as the maintenance and improvement of the railroad properties are concerned, the results have not been conspicuously successful because of the priority of other demands upon the supplies of labor and materials. Only 38 per cent of the authorizations for capital improvements had been expended up to November 1, and while special attention has been paid to the repair of cars and locomotives, rail and tie renewals have fallen behind. While the capital expenditures represent a greater sum of money than has been so expended in the past two or three years, the increased prices will offset the difference to a considerable extent. Deliveries of cars and locomotives have not fulfilled the expectations announced by the Railroad Administration when the orders were placed, but while some of the delay is doubtless attributable to the time consumed in the preparation of standard designs and under the new method of centralized purchasing the requirements of the railroads in the United States were allowed to give way to the requirements for equipment for use on our military lines abroad.

As to the promotion of a spirit of sympathy and a better understanding between the administration of the railways and their employees, opinions seem to differ widely. While Mr. McAdoo has made himself popular with the employees whose wages he has increased, the various wage orders have caused some dissatisfaction because of changes in the relations between the wages of various classes of employees, and there have been indications that the popularity of the director general has been somewhat at the expense of the discipline and of the respect for supervising officers because of the tendency on the part of employees to look to Washington. There have been also many reports of lack of courtesy on the part of employees which has been attributed by some observers to the lack of respect for local officers, but may be attributed in part to the general spirit of independence at a time when men were scarcer than jobs.

Any analysis of the results obtained this year in the direction of the application of economies, which Mr. McAdoo stated as his fourth purpose, would better await more complete reports which are soon to be made available. The various steps taken in this direction have been rather fully described in various issues of the *Railway Age*.

In all that it has accomplished the Railroad Administration has had an enormous advantage over private railroad corporations in the almost autocratic power placed in the hands of the director general by the federal control law and the ability to subordinate the question of expense. Whether or not such powers would be allowed to continue long during peace times, the director general was given sufficient authority to make rates commensurate with the expenses and was given in addition an appropriation from which he can draw if the rate increase for this year proves insufficient. He was not hampered by the difficulties of reconciling conflicting interests and he was able to disregard the various restrictions imposed by laws and commission orders on the railroads. The Sherman law did not apply to his operations, the right given the shippers to route their freight became non-existent, he was able to increase demurrage rates to a figure sufficient to penalize delays in loading and unloading cars, the tariff minimum weights no longer stood in the way of economical loading of cars, and neither competition nor the pressure of shippers, labor organizations or state commissions was allowed to interfere with sound railroad practices. Whether similar powers can, as a matter of practical politics, be conferred upon the railroads under other conditions and whether they could be made equally effective without a considerable degree of centralization, are questions that will doubtless be fully discussed in the near future.

The Suspension of Commission Regulation

Interstate Commerce Commission Divested of Most of Its Authority; State Bodies Ignored

ONE OF THE MOST interesting aspects of the railroad situation during the past year has been the practical absence of commission regulation. When affairs came to such a pass that the government realized the necessity of giving more consideration to the practical question of getting the utmost efficiency out of the transportation machine than to the question of preventing some railroads from earning too much money, the government demanded for itself a freer hand than it had allowed the railroad managers. This was justified both on the ground of efficiency and on the theory that the government need not regulate itself. When the federal control act was passed, very largely in the language which had been suggested to Congress by Mr. McAdoo's representative, it was found to contain a provision that the carriers while under federal control should remain subject to all laws and liabilities as common carriers "except in so far as may be inconsistent with the provisions of this act or any other act applicable to such federal control or with any order of the President."

As a result, while the organization of the Interstate Commerce Commission has been made useful in various ways by the Railroad Administration, and while it has been allowed to preserve the continuity of its records and, therefore, has been kept about as busy as before, the commission has been temporarily divested of most of the authority it formerly possessed.

The state commissions were not even mentioned in the federal control law and they have been almost as completely ignored by the Railroad Administration ever since. As far as railroads are concerned, the state commissions have hardly even been kept busy, except for their efforts to preserve their former prerogatives and to persuade Mr. McAdoo and his organization to accept their co-operation in some way that would give them a hand in the game.

The relation of the Interstate Commerce Commission to federal control has been very clearly set forth in the commission's annual report, of which an extensive abstract was published in the *Railway Age* of December 6. In the first stages of federal control individual commissioners and bureaus of the commission performed some useful services for the Railroad Administration, four commissioners took part in the negotiations with the railroad companies over the draft of the standard compensation contract, and the commission itself, under the terms of the law, has certified to the President the amount of the net operating income for the years 1915, 1916 and 1917, which is the basis for the compensation of the companies.

Another function of the commission in relation to the Railroad Administration has been advisory, the rendering of advice at the request of the director general in matters affecting the shipping and traveling public, such as the proposed consolidated freight classification and the advance in express rates. In both cases the commission was not asked to decide anything. The Railroad Administration assumed the responsibility but the commission was asked to give its judgment as to the effectiveness of the methods proposed to attain the desired object.

The authority which the commission has so long exercised in the regulation of rates was largely taken away from it by the provision in the federal control law authorizing the President to initiate rates and prohibiting their suspension, although the commission was authorized to enter upon a hearing and review presidential rates after they were in effect,

upon complaint. Under the broad powers thus conferred the director general was able to put into effect a 25 per cent increase in freight rates and an advance in passenger fares to 3 and 3½ cents a mile without even asking the commission's advice and upon less than the statutory 30 days' notice, and while the commission retained its jurisdiction over the rates of carriers not under federal control and over the joint rates between federal and non-federal roads, it has usually been prompt to accede to the requests of the Railroad Administration in such cases. While a large number of complaints have been filed with the commission attacking rates made by the Railroad Administration, the commission has decided only a few of them, which involve questions of relationships, rather than absolute reasonableness. In these cases the commission asserted its power to change the rates but it has not yet passed directly upon the 25 per cent increase in any case and numerous problems created by the somewhat arbitrary manner in which the increase was put into effect are still before it. Meanwhile numerous adjustments of rates of the kind which formerly were referred to the commission have been handled by joint committees, of railroad traffic officers and shippers, created by the Railroad Administration.

State Commissions Not Consulted

The Interstate Commerce Commission has apparently appreciated the necessity for the exercise of autocratic powers by the Railroad Administration during war time, and whether or not it has approved everything that has been done, it has at least been able to maintain harmonious relations with the Railroad Administration; but the same thing cannot be said of the state commissions. The very fact that there are 47 of them made it difficult to deal with them on any effective basis of co-operation, and when the Railroad Administration early indicated its intention of handling the transportation situation as a national proposition, without taking time to consult with the state authorities or allowing itself to be interfered with by them, a state of strained relations soon became apparent, which was not improved by the tendency on the part of some railroad officers to make the most of their independence. The difficulty was increased by the fact that the provisions in the law are not so specific as to remove all doubt as to the respective jurisdiction of the states and the federal government. The law provided that nothing in the act should be construed "to amend, repeal, impair or affect the existing laws or powers of the several states, except wherein such laws, powers or regulations may affect the transportation of troops, war materials, government supplies or the issue of stocks and bonds." The state commissioners argued that this was intended to preserve state regulation in so far as it did not interfere "in any proximate and tangible way with the transportation of troops and munitions," and that this included authority over intrastate rates as an exercise of police powers. The Railroad Administration never specifically stated its interpretation of this language, but in practice it has initiated intrastate as well as interstate rates and has filed tariffs with the state commissions "for information only" and not in accordance with state statutory provisions.

In matters of service the Railroad Administration has acted apparently upon the assumption that its authority was complete, and while Mr. McAdoo has indicated a willingness to receive advice and suggestions from the state commission-

ers, and in many cases has adopted their recommendations in local matters, it was made clear to the state commissioners that the deciding power was at Washington, and that their recommendations would have more practical effect than their orders. This, however, was not the kind of recognition that the state commissioners wanted, and while many of them were jealous of their authority and resented being ignored, others were frankly puzzled as to how to comply with their local statutes. During the war most of the state commissions refrained from actively pressing the issue, but at the convention of the National Association of Railway and Utilities Commissioners in Washington after the armistice was signed the restraint was removed and resolutions were adopted asking recognition of the full and un-

impaired authority of the states, and declaring that "in any event it is the duty of each state commission to exercise and maintain its statutory authority to the extent which it may deem the public interest demands."

Mr. McAdoo yielded to the protests of the state commissioners, reinforced by a number of congressmen, particularly from the South, in one important instance. When General Order No. 28 was issued, providing for the general increase in rates, it was proposed to remove all conflict between state and interstate rates by first raising the state rates to the level of the interstate rates in the same territory before applying the 25 per cent increase. This would have resulted in some very large increases in some states, and Mr. McAdoo was finally persuaded to omit the first advance.

Transportation Facilities of the A. E. F.

Necessary to Build Vast Piers, Docks and Warehouses and Much Track, Rolling Stock and Other Facilities

THE RAILWAY TROOPS recruited in this country under the direction of S. M. Felton, director general of military railways, and sent to France for work in connection with the transportation of the American Expeditionary Forces, up to November 30 aggregated 1,921 officers and 62,859 men actually attached to organized military units, in addition to a large number of officers and men sent from time to time as casuals.

While the complete story of the accomplishments of the railway engineers in France, as their contribution to the big job of winning the war, is yet to be told, we have secured some data which gives an idea of the extent of the transportation operations required to meet the needs of our army abroad. Before the armies could function in the field vast piers, docks and warehouses had to be built at the French ports assigned to the American forces, and railroads with the necessary rolling stock for the transportation of troops and supplies had to be either constructed or secured from the French. These operations involved the development of some 16 French ports from the English Channel to the Mediterranean, with such facilities as piers, unloading machinery, warehouses, and railroad yards and terminals, the repair, ex-

pansion and maintenance of the standard gage railroad lines assigned by the French, the construction of narrow-gage lines from the rail heads of the main lines to points near the trenches, and the provision of cars and locomotives, as well as the crews to operate them.

A total of 957 miles of standard gage railway track had been laid in France by the American railway engineers up to November 30. This comprises yards and sidings only, as, contrary to a rather widespread impression which has been allowed to spread because of the secrecy maintained during the war, the Americans built no new main line railroad in France, except for the 5.75 mile double track cut-off built to run trains around the city of Navarre, which was described in the *Railway Age* of December 6. As fast as they could supply the men and equipment the American railroad men undertook the operation of their own trains over several hundred miles of French railroads which had been assigned to their use, extending from the various ports toward the American front in the Toul sector, and they built their own yards, terminals and sidings, including terminal facilities for each engine district.

The transports supplying the American Expeditionary



S. M. Felton, Director General of Military Railways, and Commissioned Officers of His Staff. Front Row, Left to Right: Major W. W. Sullivan, Lt. Col. W. H. Holcombe, Col. J. M. Wright and S. M. Felton

Forces used 74 berths located at La Havre, Brest, St. Nazaire, Les Sables-d'Olonne, Nantes, La Pallice, Rocheport, Paullac, Bassens, Bayonne and Marseilles. New trackage had to be built in connection with the development of these ports, whose capacity was increased from 5,000 tons a day last January to 33,400 tons a day at the close of hostilities. From the ports the rail lines used by the Americans converge toward the front and in the vicinity of the trenches supplies were transported from the standard gage railheads over more or less temporary light railways of 60 cm. gage that were extended as the line advanced.

A total of 1,358 standard gage steam locomotives of the "Pershing" Consolidation type have been shipped to France for the use of the American Expeditionary Forces, and 65 additional engines of this kind have been shipped for the use of the French government. In addition, 332 locomotives of this kind were en route to France on November 30 or on docks in the United States awaiting shipment. Fifteen extra tenders for these engines have also been shipped. Thirty saddle tank switching locomotives are now in use by the American Expeditionary Forces. Ten gasoline locomotives of 150 h.p. each are in use in France, and six additional engines of this kind were en route.

Forty-five 36-inch gage steam locomotives are in use in France and one such engine was en route. One hundred and ninety-one steam locomotives of the 60 cm. gage are in use in France, and 30 of these engines were either en route or are on the docks in the United States awaiting shipment. Sixty-five 35 h.p. gasoline locomotives, 60 cm. gage, are in use in France, while 108 50-h.p. gasoline locomotives, 60 cm. gage, are in France, and one was en route. A total of 2,189 locomotives had been shipped to France either for the use of the American Expeditionary Forces or of our Allies.

The following standard gage freight cars have been delivered in France for the use of the American Expeditionary Forces: 4,459 box cars, ordinary; 3,350 box cars with cabs, 1,225 high-side gondolas with tarpaulins, 1,425 high-side gondolas without tarpaulins, 3,429 low-side gondolas, 1,700 flat cars, 675 tank cars, 950 refrigerator cars, 400 ballast cars, 150 six-yd. dump cars, 150 12-yd. dump cars, 100 16-yd. dump cars, two 100-ton freight cars, 796 motor cars, 352 hand cars, 108 push cars, total 19,271; 3,217 standard gage cars were either en route to France or on the docks in the United States awaiting shipment.

The following narrow gage cars have been delivered to the American Expeditionary Forces, or were en route thereto:

36-inch gage, 400 flat logging cars; 40 cm. gage, 500 dump cars, and 1,000 push cars; 60 cm. gage, 600 box cars delivered and 65 en route, 166 tank cars, 500 flat cars, 1,555 low-side gondolas, 230 one-yd. V-dump cars, with 64 additional en route. One hundred of the 1½ V-dumps have been delivered and 100 were on the way; 100 artillery trucks have been delivered and 100 additional were en route; 970 motor cars, 180 inspection cars, 300 hand cars and 990 push cars have also been delivered.

Shipments to France of locomotive cranes total 120, ranging in capacity from 7½ to 35 tons. Thirty-three five-ton gantry cranes and 15 10-ton gantry cranes were also shipped for the unloading of equipment at the ports of debarkation.

Two standard gage locomotive repair shops, each accommodating a road equipment of 1,500 locomotives have been constructed. One of these shops is situated at Nevers and the other at Melun. At La Pallice one standard gage erection shop with a capacity of 100 cars per day was completed. Twelve engine houses, each handling from 50 to 75 locomotives per day have been built.

A narrow gage locomotive repair shop accommodating 120 locomotives per month was constructed at Dijon, and an addition to this plant is being erected which will increase its capacity 50 per cent. There are two base and four field narrow gage engine houses which have also been built.

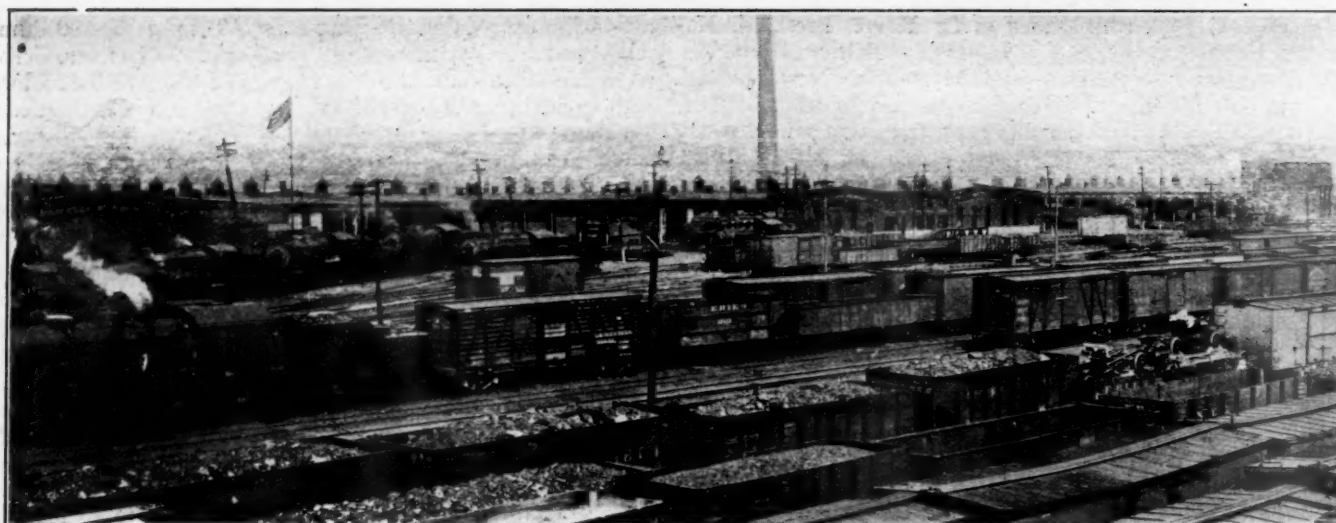
The following narrow gage track and track materials have been sent to France: 150 miles 40 cm. fabricated track, with 12-lb. rail; 490 miles of 60 cm. fabricated track, with 25-lb. rail; 435 miles, 25-lb. rail and fasteners.

Court Overrules Director General

In a suit brought by Robert McKay against the Erie Railroad Company to recover \$25,000 for personal injuries, Judge Vickery, of the Court of Common Pleas, Cleveland, Ohio, overruled a motion to have the Erie dismissed as a defendant and the director general substituted, in accordance with the order of the director general concerning the filing of personal injury claim suits. This motion was denied by the judge, who stated orally that he believed that under Section 10 of the Act of Congress of March 21, 1918, actions such as the one before him were properly brought against the carrier company. While this case was pending prior to the date of the director general's order, the tenor of the court's remarks did not indicate that his holding would have been different if the action had been brought since.



Front Row Left to Right: Col. J. Milliken, Major W. W. Houston, Major G. R. Tuska and Capt. C. R. McKinsey



The Motive Power and Rolling Stock Situation

Condition of Locomotives Much Improved During the Year;
Car Conditions Are Less Favorable

DURING THE PAST YEAR, up to November 30, the records of the Railroad Administration show that the railroads of the United States have received 2,343 new locomotives, of which 1,364 were built on orders placed by the railroads prior to the institution of government operation, 546 were United States Railroad Administration standard types and 200 were Russian Decapod locomotives. An additional 105 Consolidation locomotives built for U. S. Army use overseas were placed in service during the latter part of 1917 and early in 1918. The last of these, however, was withdrawn from service to be sent overseas during the month of September.

The distribution among the various regions of the locomotives placed in service during the year is shown in Table I. It will be seen that there are to be delivered on orders already placed, 1,428 locomotives, 544 on orders placed prior to January 1, 1918, and 884 on orders for standard locomotives.

These locomotives have been placed in service on the lines where the need has been the greatest, irrespective of ownership. Table I shows that 91 new locomotives built for roads in the Southern, Central Western and South Western regions, on orders placed by the roads themselves in 1917, have been placed in service on roads in the Eastern, Allegheny and Pocahontas regions. In addition to the new locomotives, 22 old locomotives have also been transferred from roads in the south and west to those in the east, making a total of 113 locomotives now operating in regions other than those in

which the owning roads are located. There undoubtedly are some other locomotives which have been transferred between intraregional lines, but no complete data for these are available. The details of the interregional transfers are shown in Table II.

TABLE II—INTER-REGIONAL TRANSFERS OF LOCOMOTIVES FROM SOUTHERN AND WESTERN RAILROADS TO EASTERN ROADS

Purchaser or owner	New locomotives		Old locomotives		Location
	Type	Number	Type	Number	
A. T. & S. F.	2-8-2	16	....	..	Penn. R. R.
A. C. L.	4-6-2	2	....	..	N. & W.
C. & N. W. ....	....	..	2-8-0	4	B. & O. (Allegheny Region)
C. G. W. ....	....	..	2-8-0	1	Penn. Lines West
C. R. I. & P.	2-8-2	10	....	..	Penn. Lines West
C. St. P. M. & O. ....	....	..	2-8-0	2	B. & O. (Allegheny Region)
E. P. & S. W.	2-8-2	5	....	..	Virginian
Ill. Cent.	0-6-0	3	....	..	B. & O. (Eastern Region)
M. K. & T.	2-8-2	15	....	..	C. & O.
Mo. Pac. ....	....	..	2-8-0	1	Penn. Lines West
M. & O. ....	....	..	2-8-0	2	B. & O. (Allegheny Region)
St. L. S. F.	2-10-2	11	....	..	C. & O.
S. A. L.	Mallet	3	....	..	Virginian
....	Mallet	4	....	..	N. & W.
....	2-10-2	3	....	..	N. & W.
Southern	2-10-2	5	2-8-0	2	C. & O.
....	....	..	2-8-0	3	B. & O. (Eastern Region)
Southern Pacific ..	....	..	2-8-0	2	C. & O.
Union Pacific	0-6-0	6	....	..	Penn. Lines West
....	0-6-0	2	....	..	Penn. Lines West
....	2-8-2	1	....	..	B. & O. (Eastern Region)
....	2-8-2	5	....	..	Penn. R. R.
....	....	..	2-8-0	2	B. & O. (Eastern Region)
....	....	..	2-8-0	2	B. & O. (Allegheny Region)
Total .....	....	91	....	22	....

TABLE I—DISTRIBUTION BY REGIONS OF NEW LOCOMOTIVES PLACED IN SERVICE FROM JANUARY 1 TO NOVEMBER 30, 1918

Regions	Eastern	Allegheny	Pocahontas	Southern	North Western	Central Western	South Western	Total
New locomotives from builders	538	96	45	...	...	...	...	...
Transferred from western and southern railroads	31	17	43	*17	...	*48	*26	...
Total new locomotives	569	113	88	103	131	297	63	1,364
Built by railroads	16	176	1	28	9	3	0	233
U. S. R. A. standard locomotives	264	60	10	83	68	50	11	546
Russian locomotives	61	61	..	68	0	0	10	200
Total new locomotives	910	410	99	282	208	350	14	2,343
Additional locomotives to be received on orders placed prior to January 1, 1918	116	49	30	46	78	164	61	544
U. S. R. A. standard locomotives on order not yet delivered .....	...	...	...	...	...	...	...	884

*Diverted to Eastern, Allegheny and Pocahontas regions.

No Immediate Shortage of Power

Notwithstanding the fact that the number of locomotives actually built for the use of the railways in the United States during the past year and the four preceding years has materially fallen behind the 10-year average of 1907 to 1917 inclusive, and that there was an acute shortage of power apparent at the close of 1917, there is at the present time very little evidence of a lack of sufficient power to meet immediate requirements. This does not mean, however, that there is no need for new power. Old locomotives have been kept in service at a sacrifice in operating efficiency to preclude a repetition of conditions existing last winter. The number of locomotives built each year during the above mentioned 10-year period for domestic steam railroad use has averaged approximately 3,300. For the past five years, beginning with 1914, the railroads have fallen behind this figure by an average of about 1,300 locomotives each year, a decrease which can be accounted for only partially by the increase in tractive effort of the locomotives built during recent years.

There are, broadly, three factors to which the present fortunate situation must be attributed: (1) In general the power of the country is in much better condition now than at the beginning of any winter for several years past; (2) the application of economy and capacity increasing devices to existing equipment has increased the effectiveness for service of a large number of locomotives, and, (3) there are now retained in service many locomotives which, if new power were available, would, and could economically be scrapped.

Power Now in Good Condition

That the condition of power is much better than it was last year is evidenced by the fact that for several months past there have constantly been stored in serviceable condition from 800 to 1,000 locomotives, over half of them on the eastern roads, where extraordinary demands are most apt to arise. This improvement has been made possible by the increased working hours which have been in effect since last spring, the decrease in labor turnover during the latter part

country as a whole, the increase in output is more than accounted for by the increase in maintenance forces and the increase in working hours from the eight, nine and ten-hour days in effect in various parts of the country, to the 70-hour week which was in effect on many roads from March to November 25. During the period covered by the table it also will be seen that there has been a gradual increase in the number of locomotives being repaired for other lines, the maximum shown being 284 during the first week in November.

Since November 25, when working time was reduced from 70 hours a week to a nine-hour day basis, followed on December 9 by a further reduction to an eight-hour day, there has been a decrease in output which has been felt more particularly in running repairs. The eight-hour day necessitates the employment of three shifts at engine terminals, with a consequent increase in supervision, where two shifts have heretofore been the rule. At present, in most cases practically the same number of men who have constituted the two shifts must be redivided into three. It will, of course, be possible gradually to build up these forces to overcome the present shortage as demobilization progresses. The power has been put in such good condition during the past summer and fall that the reduction in back shop output following the reduced number of working hours on the whole need give little immediate concern.

Old Power Modernized

Since 1914, the conditions which have restricted the buying of new power have directed attention to the possibilities for increasing the capacity of a large number of existing locomotives by the application of economy and capacity increasing devices, most important of which are the superheater, mechanical stoker and brick arch. During the past four years not less than 10,000 old locomotives have been equipped with one or more of these devices. In some cases the conversion has made unnecessary the purchase of a new class of power to perform the service which these engines were becoming unsuitable for, but which they are now cap-

TABLE III—WEEKLY SUMMARY OF THE CONDITION OF POWER ON THE RAILROADS OPERATED BY THE UNITED STATES RAILROAD ADMINISTRATION

Week ending	Number of locomotives			Per cent of locomotives out of service for over 24 hours	Number of locomotives turned out of shops			Number of locomotives		Number of employees in locomotive department		
	On lines	Serviceable	In or awaiting shops		1918	1917	Increase	Being repaired for other lines	Stored serviceable	1918	1917	Increase
August 3.....	62,764	53,665	9,999	14.4	5,329	4,462	867	190	924	261,915	241,104	20,811
August 17.....	62,740	53,398	9,342	14.8	5,260	4,337	923	177	708	262,056	240,615	21,441
August 31.....	62,908	53,932	8,974	14.2	5,828	4,940	888	194	848	264,349	241,845	22,504
September 14.....	63,119	53,774	9,345	14.8	5,686	4,507	1,179	199	994	273,752	245,996	27,756
September 28.....	63,126	53,987	9,139	14.4	6,083	4,806	1,277	236	913	275,326	247,533	27,793
October 12.....	63,162	53,874	9,288	14.7	5,576	4,599	977	245	901	270,287	249,543	20,744
October 26.....	63,247	53,711	9,536	15.0	5,807	4,723	1,084	274	875	271,554	250,195	21,359
November 9.....	63,269	53,357	9,912	15.6	5,791	4,636	1,155	284	878	276,837	253,066	23,771
November 30.....	63,418	53,641	9,777	15.4	6,317	5,054	1,263	259	1,119	281,384	253,788	27,596

of the year and the increase in the number of men employed on locomotive maintenance. Both of the latter are the result of the wage increases put into effect by the Railroad Administration.

What has been accomplished in increased shop output will be evident from an inspection of Table III, showing the condition of power for alternate weeks during a period of 18 weeks, for the months of August to November inclusive, which has been compiled from data collected by the equipment maintenance section of the Division of Operation of the Railroad Administration. For this period, which is practically one-third of the year, it is evident that the number of locomotives turned out of shops (including all engines out of service for repairs over 24 hours) is nearly 23 per cent greater than during the corresponding period of 1917, while the number of employees in the locomotive department has been approximately nine per cent to 11 per cent greater than the number in service last year. Taking the

able of performing satisfactorily. In such cases each converted locomotive has saved the purchase of a new one, while in others the saving in new locomotives has been in proportion to the increase in capacity effected by the change, which conservatively would be between 10 and 20 per cent. It is evident that these 10,000 converted locomotives have had a material influence in preventing an acute power shortage.

Many Locomotives Should Be Scrapped

While the use of obsolete locomotives, to scrap which authorization has been secured or is contemplated, may be effective in preventing an acute shortage of power, it can be justified only to meet an emergency. With such locomotives in service it cannot truly be said that there is no shortage of power. In the interest of economical operation it is now imperative that there be a heavy purchase of new power in order that the three or four years' accumulation of scrap power may be gotten off the lines.

The Car Situation

Although there has been some improvement in the percentage of bad order cars in the course of the year, it is doubtful if there has been any real improvement in the condition of freight cars such as noted in connection with locomotives.

In the first place the number of new cars delivered to the railroads during the past year was less than half the number which were placed in service during 1917, and is hardly large enough to take care of normal replacements. The extreme need of equipment during the past year has therefore led to the retaining in service of a large number of cars which should be and will be retired at the first opportunity. These cars, unlike old locomotives, cannot be kept in condition to remain in service without causing an undue pro-

The pooling of equipment has also tended to decrease the output of running repairs. It is a comparatively simple matter to supply material for the repairing of home line cars at outlying points where mill facilities are not available. Considerable delay is inevitable, however, where a very large percentage of the cars on the repair tracks belong to foreign lines, each requiring more or less special material.

The destruction of the incentive of the pieceworker following the failure to adjust the piecework wage differential to correspond to the increase in hourly rates, has had a much more marked effect in reducing the output in the car department than it has in the locomotive department.

The effect of these adverse conditions is not reflected in the percentage of bad order cars, which has been maintained

TABLE IV—WEEKLY REPORTS OF CAR CONDITIONS FOR ALL REGIONS

Week ending	Oct. 19	Oct. 26	Nov. 2	Nov. 9	Nov. 16	Nov. 23
Number of roads reporting.....	139	139	138	139	139	139
Total revenue cars.....	2,478,704	2,441,111	2,434,255	2,437,344	2,430,606	2,447,922
Bad order cars—1918.....	140,328	139,548	135,462	134,874	132,853	130,048
Bad order cars—1917.....	131,036	132,501	128,957	129,414	124,162	123,056
Heavy repairs—1918.....	82,459	82,078	79,559	79,198	77,966	78,941
Light repairs—1918.....	57,869	57,470	55,903	55,676	54,887	51,107
Percentage of bad order cars.....	5.7	5.7	5.6	5.6	5.5	5.3
Average number of bad order cars repaired per working day..	86,486	83,279	83,328	83,469	82,274	82,805
Heavy repairs	9,332	8,871	8,578	8,797	8,173	8,209
Light repairs	77,154	74,408	74,750	74,672	74,101	74,596
Number of cars transferred to other shops.....	5,075	626	589	253	485	524
Number of employees—1918.....	140,021	138,703	158,959	142,500	141,540	143,169
Number of employees—1917.....	118,758	123,156	124,256	124,521	123,966	124,319
Number of cars damaged in trains.....	13,605	13,060	12,446	12,364	12,255	12,668
Cost of labor.....	\$126,630	\$121,275	\$90,464	\$122,463	\$128,925	\$135,887
Cost of material.....	\$154,708	\$151,476	\$170,532	\$162,818	\$179,972	\$182,005
Number of cars damaged in yards.....	5,264	4,868	5,267	5,275	5,159	5,242
Cost of labor.....	\$54,308	\$46,823	\$53,492	\$49,959	\$50,886	\$52,406
Cost of material.....	\$76,589	\$61,135	\$68,072	\$66,920	\$93,720	\$70,987
Cars held to be dismantled.....	5,584	7,211	6,920	6,823	6,646	6,640

portion of failures, and the need of retirement is therefore greater than in the case of motive power.

Those roads which had practically completed extensive reinforcement programs prior to our entrance into the war still have their equipment in excellent condition. Many roads, however, were only instituting such programs or had only partially carried them out before the pooling of equipment took the rolling stock out of the control of the owning

between five and six per cent, a figure approximately equal to the average for the country in 1917. An inspection of Table IV, however, shows that of the total number of bad order cars shown on the weekly statements of the maintenance of equipment section of the Division of Operation of the Railroad Administration for the six weeks ending November 23, from 58.7 per cent to 60.7 per cent are classed as needing heavy repairs. Of the corresponding daily output the number of heavy repairs has averaged a fraction above 10 per cent. It is evident, therefore, that there is an accumulation of cars needing heavy repairs, which eventually must be reckoned with. If this situation is to be improved some means should be taken to return the cars to the owning roads at the earliest possible opportunity, where in many cases material for reinforcing is already available, as in this way only can the greatest output be obtained for the labor expended.

Air brake conditions have been notably poor during the past year. This is due in part to a lack of proper facilities for testing and repairing brake equipment, to the necessity for employing many inexperienced men on this class of maintenance, and in part to a shortage of material.

TABLE V—PERCENTAGE OF BAD ORDER CARS BY REGIONS

Week	Oct. 19	Oct. 26	Nov. 2	Nov. 9	Nov. 16	Nov. 23
Eastern	6.3	6.4	6.2	6.3	6.1	6.1
Allegheny	7.1	7.1	7.1	7.0	6.7	6.4
Pocahontas	5.9	6.9	5.8	5.6	5.6	5.1
Southern	4.4	4.8	4.5	4.7	4.8	4.4
Central Western	5.0	4.9	4.7	4.8	4.8	4.7
South Western	3.1	3.1	2.9	2.9	2.8	2.8
North Western	5.7	5.4	5.4	5.2	5.3	5.2
All regions	5.7	5.7	5.6	5.6	5.5	5.3

roads. In such cases there has been very little opportunity during the past year to continue the betterment program, the proportion of cars on home roads being so small as to very seriously slow up this work.



Bailey—First Station South of Nenana, Mile 407.

The Supply Industry's Output of War Products

How Manufacturers of Railway Materials Responded to Call for Military and Naval Equipment

MODERN WARFARE is a struggle of industries as well as of armies and navies. One of the things which made the German Empire so formidable a foe was the fact that it was the leading producer of guns, ammunition and other military supplies, for many years prior to the opening of hostilities in 1914. The United States and Canada, although industrial nations, had manufactured products useful to mankind in the pursuits of peace, and when involved in the conflict were forced to refit and remodel their shops and factories to supply war-time needs. How rapidly and how well this was done is common knowledge, but the extent to which railway supply companies participated in this work has not been given any appreciable publicity up to this time.

For the purpose of gathering a few facts concerning the part taken by the railroad supply industry in the manufacture of war supplies, the *Railway Age* recently sent inquiries to practically all companies which can be properly classed as belonging to that field. This information was not sought with the idea of setting out any particular manufacturers as worthy of greater distinction than others. In fact, approximately 25 per cent of those replying stated that they had continued to supply the railroads of this country exclusively throughout the war. In doing so they were performing a patriotic and highly important service, as adequate transportation is second only to the army and navy as an arm of warfare. The sole aim of the inquiry was to learn the degree in which some supply industries were transformed by the world upheaval and the various kinds of war materials they made.

The materials manufactured by railway supply companies include a great variety of war supplies. Among them were aeroplanes and accessories for airplane motors, 155 mm. howitzers, gun and ammunition carts, gun carriages, machine gun parts, shells, shell forgings, artillery hub bushings, drop bombs, steel mines and buoys, life boats and life boat parts, steel work for U. S. destroyers and merchant vessels, flanging and machine work on armored fighting tanks, entrenching shovels, linings for steel helmets and engineer depot motor truck machine shops. A number of companies supplied materials and machinery for the shipbuilding yards, such as shipbuilding gantry locomotive cranes, railroad material, work locomotives, ship material and staybolts for marine tube boilers. One manufacturer produced roofing and waterproofing papers for cantonments; another shipped iron culvert pipe to France for use in the construction of military railways; a considerable number manufactured cars or locomotives, or parts thereof, for war service abroad.

Six railway supply companies reported that they had devoted 100 per cent of their plant capacity to war work; two stated that they were in the 98-per cent class; three rated their production at 95 per cent; one at 92 per cent; two at 90; two at 80, and the remainder at varying percentages below that figure. Some were unable to make any definite estimate of the proportion of their output which could be classed as war production.

The lack of uniformity in the replies received makes generalization difficult. In the belief that the information received concerning the individual companies will prove of interest, some of the facts divulged in response to our inquiries are presented.

What Each Company Did

The American Brake Shoe & Foundry Company acquired five new plants primarily for war work at Erie, Pa. These cover an area of about eight acres. One plant was devoted

exclusively to war production and employed about 7,500 men. In one shop the company produced 155-mm. howitzers at the rate of 10 per day; in another shop 155-mm. high explosive shell bodies at the rate of about 3,000 per day, and in another 9.2-in. shell bodies at the rate of 1,300 a day.

The American Castings Company, Birmingham, Ala., received one direct war contract which called for a large shipment of National lock joint cast iron culvert pipe to France for use in connection with the construction of military railroads.

The American Flexible Bolt Company, Pittsburgh, Pa., increased its plant capacity considerably toward the end of 1917 to provide for an anticipated increase in the locomotive staybolt business. When this did not materialize because of war conditions the company contracted with the Emergency Fleet Corporation for its requirements of staybolts for marine tube type boilers. This work is still in progress, and the company expects to continue the manufacture of staybolts for marine boilers.

The American Steel Foundries produced shell forgings, ingots for shell forgings, castings for gun mounts and gun carriages, together with other Ordnance Department castings, and castings for submarines and battleships, davitt fittings, anchors and miscellaneous castings for the Emergency Fleet Corporation. Approximately 40 per cent of the company's steel casting capacity, 10 per cent of its structural plant capacity and 100 per cent of its forge plant, were used for war purposes. About 40 per cent of the total number of employees were engaged in war production. The company's forging shop at Indiana Harbor, Ind., was constructed primarily for war work. It consists of a main structure, 600 ft. by 175 ft., with an addition, 75 ft. by 500 ft. There is also a pump house in connection with this plant, 36 ft. by 300 ft. A number of additions have been made to the old plants of the American Steel Foundries during the past two years, but these were intended as permanent fixtures in the company's equipment and not solely as a means for increased war production.

In 1917 about 62 per cent of the locomotives built by the *Baldwin Locomotive Works* were for war service. During the first ten months of 1918 the proportion was 67 per cent. In addition to locomotives, the company built shells and gun carriages, although the relative output of these was small. As the result of war demands, the existing plants at Philadelphia, Pa., and Eddystone were enlarged. In Philadelphia an addition was built to the truck shop, and an eight-story reinforced concrete building was erected for shell work. New shops for shells and a large locomotive erecting shop were also constructed at Eddystone, Pa.

The Barco Manufacturing Company, Chicago, used most of its capacity for Railroad Administration work. About 15 per cent of its output, however, consisted of specialties for the Pershing engines manufactured for use on the military railways in France.

The Berger Manufacturing Company, Canton, Ohio, is another 100 per cent concern. Its output consisted of sheet metal products.

The Buda Company, Harvey, Ill., manufacturer of trucks and tractors, was on a 60 per cent war basis.

The L. S. Brach Supply Company, Newark, N. J., devoted 95 per cent of its plant capacity to war production. It manufactured telegraph and telephone instruments, antenna reels, radio sets, metal flagstaves, breast reels, projectors, compasses, etc.

The Chicago Bridge & Iron Works, Chicago, was on a 100 per cent war basis, 75 per cent of its output being ship material for the Emergency Fleet Corporation, 15 per cent powder plant work, 5 per cent steel tanks for the army and navy departments, and 5 per cent miscellaneous structures for plants engaged on war contracts.

The Cleveland Twist Drill Company, Cleveland, Ohio, devoted practically 98 per cent of its plant capacity to war work. It erected one new plant, which added about one-third to the total manufacturing floor space. Its production consisted of the company's regular line of drills, reamers, etc. The importance of a drill becomes evident when one considers that a 3-in. shrapnel shell contains 70 drilled holes, totalling 19¼ in. in depth. On a conservative estimate, a million shells of somewhat similar dimensions were the daily food of the European Mars. That means that 1,600,000 ft., or over 300 miles of drilled holes were shot away every 24 hours on the battle fronts of Europe.

The Dominion Foundries & Steel, Ltd., Hamilton, Ont., reports that 80 per cent of its capacity was devoted to ordnance work and the balance to indirect war work. Cast steel slugs and shell forgings represented 80 per cent of the output previous to the signing of the armistice; miscellaneous work, including machining of shrapnel and 4.5-in. shells, constituted 5 per cent of the total production, ship castings and forgings 5 per cent, and the remainder, castings and forgings and rolled plate for railway cars, locomotives, etc. The company's plant is now from four to six times its pre-war size. The Dominion Foundries claims to be the originator of the direct conversion of shell scrap to shell forgings. It also claims a forging record of 1,846 9.2-in. shell forgings made on a single press in a 24-hour run. It also believes it holds the record for 6-in. shell forgings, i. e., 3,115 produced by a single press in a 24-hour run.

Among the war products manufactured by *A. Gilbert & Sons Brass Foundry Company, St. Louis, Mo.*, were artillery hub bushings and shells. Approximately 62 per cent of the tonnage of the company consisted of war materials.

The Hale & Kilburn Corporation, Philadelphia, used 80 per cent of its plant capacity and 95 per cent of its employees for war work. It manufactured drop bombs, machine gun parts, steel mines and buoys, truck bodies and limbers, repair cabinets, artillery trailers and steel work for U. S. destroyers and merchant vessels. An old plant with 700,000 ft. of floor space was devoted to war work and a new plant, 50 ft. by 200 ft., was constructed for the same purpose.

The Hayes Track Appliance Company, Richmond, Ind., furnished derails to a number of navy yards, shipbuilding plants and cantonments, but the volume of this business was small. About 20 per cent of the capacity of the company during one month was used for an order of material for the American Expeditionary Forces in France.

Heywood Brothers & Wakefield Company devoted about 70 per cent of the capacity of its car seat plant, located at Wakefield, Mass., to the production of war materials. Here a great variety of articles were produced, among them field litters, navy deck chairs, ammunition truck linings, aeroplane chairs, camp stools, entrenching shovels and deck coverings for destroyers and patrol boats.

The Independent Pneumatic Tool Company was on a 100-per cent war basis. Its output of pneumatic tools was increased approximately 300 per cent over the production during peace times.

The Keith Railway Equipment Company, Chicago, devoted most of its manufacturing capacity to the production of car equipment for domestic use. It received an order for the government for 500 flat cars for service in France, but this order was later canceled because of the conclusion of hostilities.

The Lackawanna Steel Company, Buffalo, N. Y., manufactured rolled steel shapes, rails, plates, structural material, bars, etc., for the use of the army and navy and other departments of the government. While no exact records are available, the company devoted its entire output to government work during a considerable portion of last year.

The Laconia Car Company, Laconia, N. H., used about 25 per cent of its plant capacity and a like percentage of its men on war work. Its only war product was 75-mm. shell forgings.

The Lakewood Engineering Company, Cleveland, was practically on a 100-per cent war basis. It added two small plants during the war and increased the capacity of the Lakewood plant by the addition of four large buildings. Its output consisted of industrial cars and concrete mixers.

The Lehon Company, Chicago, was on a 90-per cent war basis. Its output included material for railroad cars built for service in France, roofing and waterproofing papers for cantonments, hospitals, etc.

The Lima Locomotive Works, Lima, Ohio, did not engage in any direct war work, except the production of locomotives for overseas use, detailed information concerning which is published elsewhere in this issue.

About 5 per cent of the output of the *Morden Frog & Crossing Works, Chicago*, was for overseas railroads and navy and cantonment yards in this country.

The More-Jones Brass & Metal Company, St. Louis, Mo., produced brass, bronze and phosphor bronze castings used in connection with orders for the Navy, Ordnance Department and Shipping Board.

The National Car Coupler Company, Attica, Ind., devoted about 95 per cent of its plant capacity to war production. About 80 per cent of the war output was tractor work and 5 per cent locomotive cranes.

The Orton & Steinbrenner Company, Chicago, rated its war output at 98 per cent. It produced locomotive cranes, shipbuilding gantry locomotive cranes, clamshell and orange-peel buckets, all but 2 per cent of which were contracted for by the War Department. The company constructed one temporary building, containing about 8,000 sq. ft. of floor space for war purposes. It doubled its peace-time output.

The Parkesburg Iron Company, Parkesburg, Pa., devoted about 11.6 per cent of its capacity during 1918 to orders for the United States Navy and 14.4 per cent to contracts of the Emergency Fleet Corporation. The sole output of the company consisted of Parkesburg charcoal iron boiler tubes.

The Pettibone Mulliken Company, Chicago, manufactured frogs and switch material for railway construction in France. It estimates that about 20 per cent of its plant capacity was devoted to this work.

The Pittsburgh Testing Laboratory has been engaged in tirely in war work. This company is not a manufacturing concern, but rendered service to this country by testing materials and inspecting the workmanship of the products of industrial plants. This inspection was done not only for the United States government, but for the governments of the allied nations. The company's six-story laboratory and office building and equipment at Pittsburgh was turned over to the Bureau of Aircraft Production as a research laboratory. A new laboratory, having approximately 35,000 sq. ft. of floor space, was built to take its place and additional laboratories were installed at Detroit, Mich., and Birmingham, Ala., while the size of the New York branch was quadrupled.

The H. K. Porter Company, Pittsburgh, Pa., produced locomotives for the army and navy in this country and abroad, and for the use of the allied nations, turning out marine engines and reversing engines for the use of the Emergency Fleet Corporation, and at the same time did all of the

flanging and a good deal of the machine work on the armor plate for 5,000 of our armored fighting tanks. The company was on a 92-per cent war basis.

The *St. Louis Car Company*, *St. Louis, Mo.*, devoted about 90 per cent of its plant capacity and a like percentage of its employees to war production. Its output included aeroplanes, gun and ammunition carts, engineer depot motor truck machine shops, life boat parts and freight cars for war service in France. A new steel shop, with 200,000 sq. ft. of floor space, was erected for war work.

The *T. H. Symington Company* did not utilize its plant at Rochester, N. Y., for war work, but did organize a new company which constructed a plant at Chicago for the

forging and machining of 75-mm. shrapnel and high explosive shells and of 75-mm. field guns and 155-mm. shells.

Approximately 50 per cent of the output of the *Western Wheeled Scraper Company*, *Aurora, Ill.*, consisted of standard gage air dump cars for the construction and maintenance of military railways in France. In addition, the company produced small narrow gage cars for work near the front lines and practically every earth and stone handling tool that it manufactured for construction work on roads and railroads, including elevating graders, engine and horse-drawn road graders, wheeled scrapers, drag scrapers, grading plows, rock crushers, dump wagons and cars. The company was on a 95-per cent war basis.

A Chronological History of Government Control

Important Steps in the Development of the Organization and Policy of the Administration

DURING THE 12 MONTHS that have elapsed since the government assumed control of the railroads, the roads have undergone changes which have been unprecedented. The director general's small original staff has developed into a great central and regional organization with departmental heads at Washington. Many of the short line railroads originally taken over have been relinquished, corporate interests have been divorced from the operating organization, rates have been increased and wages have been raised. Traffic activities have been consolidated or discontinued; cars and locomotives built to standard designs have been introduced. There is not a single department that has not undergone radical changes. While the history of government control cannot be told in a few words, a concise list of the more important developments in the order of their occurrence should prove of interest. With that thought in mind, the list given below has been prepared:

December 26, 1917. President Wilson issues proclamation taking over the railroads and appointing William G. McAdoo director general of railroads.

December 27. Director General McAdoo issues first order and appoints as assistants Walker D. Hines and A. H. Smith.

December 28. Railroads pass into control of the government at 12 o'clock noon.

December 29. General order No. 1 issued, directing employees to continue in performance of regular duties.

December 31. The Railroads' War Board resigns. Government control for purposes of accounting begins at 12 o'clock midnight.

January 4, 1918. President Wilson addresses joint session of Congress on the railroad situation. Bill for control of the railroads introduced.

January 18. Eastern, Southern and Western regions created and A. H. Smith, C. H. Markham and R. H. Aishton appointed regional directors. Railroad wage commission created.

January 21. Demurrage rates increased. Railroad wage commission organized.

January 26. Judge John Barton Payne appointed general counsel.

January 29. Demurrage rules changed to take effect February 10.

February 2. Circular on additions and betterments sent to railroads.

February 4. Railroad control bill reported to the Senate. Director general outlines duties of regional directors.

February 6. Commission on Car Service and Bureau of Car Service of Interstate Commerce Commission merged and reorganized as Car Service Section, Division of Transportation. W. C. Kendall, manager.

February 9. Organization of director general's staff announced as follows: Assistant to director general, Walker D. Hines; general counsel, John Barton Payne; director Division of Transportation, C. R. Gray; director Division of Traffic, Edward Chambers; director Division of Finance and Purchases, John Skelton Williams; director Division of Labor, W. S. Carter; director Division of Public Service and Accounting, C. A. Prouty; manager locomotive section, Division of Operation, Frank McManamy. Inter-regional traffic committee appointed.

February 15. Embargo rules of Railroad Administration issued.

February 15. Marine section of Division of Transportation created.

February 19. Safety section, Division of Transportation organized with Hiram W. Belnap, manager.

February 21. General Order No. 8 issued, outlining duties of employees.

February 22. Committee on cars of the Council of National Defense delegated to investigate standards for freight cars.

February 22. Engineering committee delegated to review improvement work appointed with Francis Lee Stuart chairman.

February 22. Railroad control bill passed by the Senate.

February 28. Railroad control bill passed by the House of Representatives.

March 7. Organization of Division of Finance and Purchases with central and regional committees announced.

March 12. Division of Capital Expenditures created and R. S. Lovett appointed director.

March 16. General Order No. 11, on universal interline way billing issued.

March 18. Circular No. 10 issued directing that expenses of financial and corporate offices shall not be charged to operating expenses.

March 21. Railroad control bill approved by President Wilson.

March 22. Consolidation of ticket offices at Atlanta authorized.

March 22. Railway board of adjustment No. 1 created.

March 26. Section for protection of property, Division of Law, created. General Order No. 15, requiring industries to pay for and maintain industry tracks, issued.

March 27. Railroad Administration asks prices on 100,000 freight cars.

March 28. Regional traffic committees created.

March 29. Specifications for standard freight cars announced. Director general authorized to exercise powers conferred on President Wilson by Congress. Inspection and tests section, Division of Transportation, created with C. B. Young as manager.

March 30. Traffic soliciting discontinued. Salaries of corporate officers charged to corporate accounts, after April 1 by Circular No. 17.

April 1. Freight car repair section, Division of Transportation, created with J. J. Tatum as manager.

April 9. Railroad traffic activities to be consolidated or discontinued. Director general orders that suits against railroads must be brought in district where plaintiff resides or where cause of action arose.

April 13. Coastwise steamship lines taken over.

April 19. Tentative specifications for standard locomotives announced.

May 1. Universal interline billing in effect. Fuel conservation section created and Eugene McAuliffe appointed manager.

May 2. Distribution of orders for 100,000 standard freight cars and 1,025 standard locomotives announced.

May 3. Committee on Mail Transportation appointed with Guy Adams as chairman.

May 8. Report of the Railroad Wage Commission made public.

May 18. Budget for improvements and extensions during 1918 given out.

May 20. Freight charges placed on a cash basis by provision of General Order No. 25.

May 23. Director General McAdoo announces that roads will be operated by federal managers.

May 25. General advances in freight and passenger rates ordered. General Order No. 27 covering general wage advance issued. Theodore H. Price appointed actuary of the Railroad Administration.

May 31. Troop movement section, Division of Transportation, created with George Hodges as manager.

June 1. Allegheny and Pocahontas regions created; C. H. Markham and N. D. Maher appointed regional directors. B. L. Winchell becomes new director of Southern region. Board of Railroad Wages and Working Conditions organized.

June 6. State commissioners ask suspension of the rate order.

June 7. Organization of American Railway Express Company announced.

June 11. Central Western and Southwestern regions formed; Hale Holden and B. F. Bush appointed regional directors.

June 11. Operating statistics section of the Division of Operation created with W. J. Cunningham as manager.

June 14. District directors for New England, and Ohio-Indiana districts appointed.

June 21. Board of Adjustment No. 2 organized.

June 22. Interstate express rates increased.

June 29. Railroad Administration relinquished nearly 2,000 short line railroads.

July 1. Announcement made that rates would be changed without authority of the Interstate Commerce Commission.

July 1. Mechanical department, Division of Operation, organized with Frank McManamy in charge as assistant director, Division of Operation.

July 3. Operating department of the Pullman Company taken over.

July 4. First standard locomotive completed.

July 10. Express and mail section of Traffic Division estab-

lished with F. S. Holbrook as manager. Agricultural section established with J. L. Edwards, as manager.

July 19. Section of insurance and fire protection organized with Charles N. Rambo as manager.

July 22. Three general and 25 district freight traffic committees appointed.

July 22. Short line railroad section formed with E. C. Niles as manager.

July 24. Wages of mechanical department employees increased by Supplement No. 4 to General Order No. 27.

August 30. Bureau of Suggestions and Complaints established under the direction of Theodore H. Price.

August 30. Freight claim section created with John H. Howard as manager.

August 20. Interchangeable mileage script on sale.

September 1. Director General McAdoo orders railroad employees to abstain from political activities.

September 1. Engineering and maintenance department of Division of Operation established; Charles A. Morse appointed assistant director, Division of Operation.

September 3. Director general reports to President Wilson on first seven months of operation of the railroads.

September 4. Director general approves standard compensation contract.

September 5. Wages of agents, clerks and laborers increased by Supplement No. 7 and wages of maintenance department employees increased by Supplement No. 8 to General Order No. 27.

September 6. Division of Inland Waterways created.

October 22. First compensation contracts signed by Director General McAdoo.

October 25. Short line contract approved by Director General McAdoo.

October 25. Standard scale of class rates submitted to the Interstate Commerce Commission.

November 16. Wages of telegraph and telephone operators increased by Supplement No. 10 to General Order No. 27.

November 18. American Railway Express Company taken over.

November 20. Express rates increased effective January 1.

November 22. Director General McAdoo announces intention to retire.

November 22. Members of Board of Adjustment No. 3 announced.

December 2. President Wilson in address to Congress proposes to relinquish railroads.

December 5. Judge Lovett resigns as director of the Division of Capital Expenditures.

December 10. Theodore H. Price resigned as actuary of the Railroad Administration to take effect January 1.

December 11. Director General McAdoo in letter to chairman of congressional committees, proposes five-year extension of federal control.

December 20. Carl R. Gray, director, Division of Operation, resigned to take effect January 15, 1919.

December 28. Supplement 13 to General Order 27 issued, making a further revision of the wage scales of telegraph operators and similar employees on the basis of a minimum of 48 cents per hour.

January 1. Secret service branch of Claims and Property Protection section of the Division of Law terminated and Secret Service and Police Section of the Division of Operation created with W. J. Flynn as chief.

Transportation of mail to Chicago by airplane has been indefinitely postponed, this because of unsuitable machines or inexperienced aviators. The Post Office Department and the War Department seem to disagree as to the cause. One of the aviators in the mail service was killed on December 30 while making a trial flight, and two others have been injured.

A Review of Railway Signaling for the Past Year

Conditions Affecting the Work. New Block Signals Nearly All Automatic. Considerable Progress in Interlocking

AS IN OTHER BRANCHES of railroad work the signal department program has been carried on during the past year with the one essential purpose of helping to win the war. The appropriations during 1918 have been large, but the actual volume of work done has been somewhat less than that of previous years. The production and the actual installation of the materials have not kept pace with the plans authorized. The improvements of the 12 months, as represented in our tables, have cost something like seven millions of dollars, the expenditures in this department to November 1, as reported by the Railroad Administration, having amounted to \$5,965,544. The delays have been largely due to the priorities for war materials which greatly handicapped the production of signal supplies. The orders now on hand that will carry over into 1919 and the amount of new work in prospect indicate a favorable year for good business in the signal field. A large amount of maintenance work should be done throughout the country during the coming year and material for this class of work will be in demand. The total authorization for the signal departments for 1918, as recorded at Washington, amounted to \$16,601,166, or much more than double the amount mentioned above as expended in the first ten months; and most of these unexpended appropriations will, no doubt, be carried out as early as practicable in 1919.

The railroads have been handicapped in maintaining their signals by the large number of new employees. During the past year the railroads have shown a tendency to place orders earlier in the year to cover material for the following year's work. This is of direct benefit, as the construction program can be started earlier than would otherwise be the case.

Orders for signal material have been received almost entirely from the larger roads. Possibly only 5 to 10 per cent of all the material ordered has been for the use of electric lines. The average prices for signal material at present are approximately 5 per cent higher than those existing a year ago, while the cost of materials and labor entering into the manufacture of signal materials in the past year is approximately 10 to 20 per cent higher. With the material and labor markets remaining at their present level the prospects are that prices will show no decided decrease in the near future.

No important developments in new signaling devices or systems have taken place during the past year. In this connection it may be noted that some railroads which have heretofore regarded up-to-date signaling as unnecessary for their lines have found that under the necessity of obtaining maximum traffic capacity it is necessary to follow modern methods. With the heavy reconstruction period ahead and the prospect that the United States will serve as the storehouse for the world, the future appears bright from the signaling standpoint as the railroads will have to handle heavy traffic and this condition should be reflected in connection with signal construction programs.

During the past year several bad collisions have occurred with heavy loss of lives. These accidents again brought to the attention of railroad and government officers the necessity of preventing insofar as possible such occurrences in the future. In this connection the automatic train stop has



been receiving careful consideration of the officers whose duties it is to investigate and report on such devices. The Bureau of Safety of the Interstate Commerce Commission has strongly advocated the development of such a device as an adjunct to the present signal system for the prevention of collisions. A committee was to have been appointed by the Railroad Administration to make a thorough study of this

NEW BLOCK SIGNALS COMPLETED IN 1918; MILES OF ROAD.

	Automatic (Table A)			Manual (Table D)			Both
	S. T. miles.	D. T. miles.	Total miles.	S. T. miles.	D. T. miles.	Total miles.	
United States	1,009	798	1,807	78	57	135	1,942
Canada	6	18	24	.....	.....	.....	24
Total	1,015	816	1,831	78	57	135	1,966

NEW BLOCK SIGNALS UNDER CONSTRUCTION, December 31, 1918.

	Automatic (Table B)			Manual (Table E)			Both
	S. T. miles.	D. T. miles.	Total miles.	S. T. miles.	D. T. miles.	Total miles.	
United States	938	577	1,515	.....	.....	.....	1,515
Canada .....	.....	.....	.....	.....	.....	.....	.....

NEW BLOCK SIGNALING PROPOSED FOR 1919

	Automatic (Table C)			Manual (Table F)			Both
	S. T. miles.	D. T. miles.	Total miles.	S. T. miles.	D. T. miles.	Total miles.	
United States	820	478	1,298	140	.....	140	1,438
Canada	4	.....	4	.....	.....	.....	4
Total	824	478	1,302	140	.....	140	1,442

INTERLOCKING SIGNALS

	Plants	Number of Levers		Total
		Mechanical	Electrical	
Completed in 1918—				
United States	142	1,982	1,222	3,204
Canada	1	6	.....	6
Under construction December 31, 1918—				
United States	135	1,604	1,642	3,246
Canada .....	.....	.....	.....	.....
Proposed for 1919—				
United States	80	932	1,264	2,196
Canada	1	17	.....	17
Total	81	949	1,264	2,213
Total United States	357	4,518	4,128	8,646
Total, Canada	2	23	.....	23
Total, United States and Canada.	359	4,541	4,128	8,669

question, but no action has yet been taken, and it is doubtful whether such action will now be taken unless other collisions occur in which the loss of life is much greater than has occurred in the past. Should this happen, public opinion may force the passage of legislation requiring such safeguards and this legislation may prove more detrimental than if the railroads themselves had developed and applied the necessary safeguards.

A review of the statistics of block and interlocking signals construction during the past year and of the plants now in course of construction shows a total of 1,966 miles of road block signaled in the United States and Canada since January 1, 1918, or 843 miles less than the total recorded for the

calendar year 1917. It is very difficult to make exact comparisons of the total mileage of road worked under the space interval system because in numerous cases the new automatic signaling has taken the place of the manual block system, and some roads have not been careful to give the full facts in such cases. Nearly all of the new block signaling installed in 1918 is automatic and in the work now under construction (1,515 miles in the United States), and proposed for 1919 (1,438 miles), the non-automatic mileage is almost negligible.

In interlocking work the roads have not made the same progress as in 1917. The total number of plants completed or on which important changes have been made is 143, as compared with 187 the previous year. There are 135 plants now under construction as compared to 164 last year. The proposed new work for 1919, totaling 81 plants, is 27 less than the number proposed a year ago. The figures given under the column of proposed work are far from complete, as a number of the roads which contemplate extensive work are not yet ready to announce their programs. As was the case last year, the Interborough Rapid Transit Company, operating both elevated and subway lines, has expended several millions of dollars on interlocking and block signal work, and the work done or proposed by this company is

prominent in all three of the interlocking tables. The figures so far available, together with the data concerning work now under construction and in respect to plants for 1919 are shown in the accompanying tables.

The data from which the totals here presented are made up is given in the tables under nine heads, as follows:

- A—Automatic Block Signaling Completed in 1918.
- B—Automatic Block Signaling Under Construction.
- C—Automatic Block Signaling Proposed.
- D—Manual Block Signaling Completed in 1918.
- E—Manual Block Signaling Under Construction (none).
- F—Manual Block Signaling Proposed.
- G—Interlocking Completed in 1918.
- H—Interlocking Under Construction.
- I—Interlocking Proposed.

Block Signaling Completed

From the reports received the largest mileage of automatic block signals installed on a single road was on the Northern Pacific, which put in service 185 miles of single track and 48 miles of double track signaling, using 387 signals. Other roads installing a mileage of over 100 are the Illinois Central, which completed 191 miles of single track and 12 miles of double track signaling, with a total of 386 signals; the Great Northern, which installed 139 miles of single track and 11 miles of double track signals, with a total of 291 signals; the Los Angeles & Salt Lake, with 132

TABLE A—AUTOMATIC BLOCK SIGNALS INSTALLED IN 1918*

Name of Road	Miles of Road S.T. D.T.	From	To	No. of Signals	Type of Signals	Control System	Remarks
Atchison, T. & S. Fe...	9	Shopton	New Boston	15	Union "S"	Track and line	
	2	Cameron	Bohn	3	Union "S"	Track and line	
	5	Braddock	Walton	6	Union "S"	Track and line	Signals for one track only.
	9	Dodge City	Wright	13	3-pos. U. Q.		
	17	Christie	Santa Fe Junc.	40	3-pos. U. Q.		
Atlanta & West Point...	19	Newman, Ga.	Hogansville	27	Union "B"	Automatic-permissive	Union.
	4	Atlanta Belt	Oakland J.	4	Union "B"	Automatic-permissive	Union.
Atlantic Coast Line...	1	Florence, S. C.	Java	11	Union "S"	Polarized	
Baltimore & Ohio	27	Confluence	Connellsville	45	Union T2	A. C.	Replacing manual.
	21	Viaduct Junc.	Foley	52	Union T2	A. C.	Replacing manual.
Balt. & Ohio (Western)	19	Botkins	Erie J.	51	D. C. Motor	Normal clear	
	5	Piqua J.	Kirkwood	15	D. C. Motor	Normal clear	
	10	Attica	Willard	21	D. C. Motor	Less than 1 mile	
B. & O. Chicago Term.		Oakley Ave.					
Boston Elevated	1	Broadway	Andrew Sq.	7	Light, 3-color	A. C. track cts.	
Central of Georgia	4	Irving	Experiment	6	Union "S"	Polarized, d. c.	
	9	Hapeville	Atlanta	17	Union "S"	Polarized, a. c.	
Central of New Jersey	1	Oak Island J.	Pt. Newark	6	Union "B", 2-arm		Union.
Ches. & Ohio of Ind.	1	Cincinnati	Brighton	5	D. C.		
Chicago, B. & Quincy	74	Burlington	Ottumwa	175	Top post: 1. q. 60 deg.		
	25	Amazonia, Mo.	Napier	95	Top post: 1. q. 60 deg.		
	2	Gibson, Neb.	Omaha	20	Top post: 1. q. 60 deg.		
	2	Holdredge, Neb.	Holdredge Junc.	8	Top post: 1. q. 60 deg.		
	21	Mendota, Ill.	Princeton	57	Top post: 1. q. 60 deg.		
	7	Wataga, Ill.	Galesburg	44	Top post: 1. q. 60 deg.		Three-track.
Chicago Great Western	1	Mason City		2	Federal "4"	Line	
Chicago, Mil. & St. P.	3	So. Minneapolis	Hennepin Ave.	13	5 bottom post, 8-color		
	2	Kinnick Draw	Union Sta.	24	Light, 3-pos., a. c.		
	36	Harlowton, Mont.	Lennep	50	3-pos., top post, d. c.		Replacing 2-pos.
	34	Three Forks	Piedmont	43	Color-light, 3-pos., a. c.		
	42	Deer Lodge	Superior	191	Color-light, 3-pos., a. c.		
		Avery, Idaho	Ethelton		Color-light, 3-pos., a. c.		A. C. track circuit, replacing d. c. five miles.
Chicago, R. I. & Pacific	8	Allerton, Ia.	Clio	21	Union "S"		Revision; change from S. T. to D. T.
Chicago, T. H. & S. E.	2	Vermilion River		2	Union "B" U. Q.		
Copper Range	1	M. P. 17	M. P. 18	6			
El Paso & S. W.	6	El Paso	M. Yard	10			Union.
	14	El Paso	Mastodon, N. M.	27			Union.
	30	Moore's, Ariz.	Peatt, N. M.	40			Union.
	4	Junction	Forest, Ariz.	6			Union.
	25	Lewis Sp'gs, Ariz.	Osborn	52			Union.
Erie	35	Lomax, Ind.	Griffith	58	Union "S"		
N. Y., Susq. & W.	2	Paterson	N. Paterson	3	Union "S"		
Grand Trunk	24	Shelburne, N. H.	Bates, Me.	42	G.R.S. "2 A" bottom-post, low volt., d. c.	Polarized line	A. P. B.
Great Northern	31	Troy, Mont.	Bonnors Fy., Ida.	53	G. R. S. "2 A"		A. P. B.
	31	Stryker, Mont.	Rexford	67	G. R. S. "2 A"		A. P. B.
	43	Essex, Mont.	Columbia Fs.	80	G. R. S. "2 A"		A. P. B.
	34	Blackfoot, Mont.	Summit	74	G. R. S. "2 A"		A. P. B.
Illinois Central	11	Long Lake, Minn.	Delano	17	G. R. S. "2 A"	Line for distant ind.	Normal clear.
	37	Gibson City, Ill.	Clinton	73	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
	45	Clinton, Ill.	Springfield	86	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
	102	Broadview, Ill.	Freeport	190	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
	4	Waterloo, Iowa	Mona	9	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
	12	Princeton, Ky.	Eddyville	19	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
	1	Fulton, Ky.	Oakes, Tenn.	7	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
Yazoo & M. V.	2	Leland, Miss.		2	Hall "K" 3-pos., u. q.	Normal clear	Traffic direction.
Interboro R. T. Co.	42			702	Light		Aggregate of 13 sections, all elevated or subway lines in New York City; includes two-track, three-track and four-track lines.
Lehigh Valley	4	1		12	3-pos. U. Q.		Aggregate of five short sections.
Los Angeles & Salt Lake	4	Guelph, Nev.	Rox	7	Federal "4 A" U. Q.		
	11	Crestline, Nev.	Tomas, Utah	18	3-pos. Federal "4 A" U. Q.		A. P. B.
	117	Lynndil, Utah	Salt Lake City	199	3-pos. Federal "4 A" U. Q.		A. P. B.

miles of single track signaling and a total of 224 signals; the Chicago, Burlington & Quincy, which completed two miles of single track and 129 miles of double track work, with a total of 399 signals, and the Chicago, Milwaukee & St. Paul, which installed 112 miles single track and 5 miles of double track automatics, using a total of 321 signals. Of this latter installation 112 miles were installed in the electrified territory in Montana, the signals consisting of the color light type, of which 284 were used.

The Interborough Rapid Transit Company, New York

City, installed 702 signals on its elevated and subway lines. These lines are of three general classes, namely, two track lines on which all trains stop at stations at frequent intervals, and on which, as a rule, there is no block signaling except at curves; four track lines on which the two inner tracks are used for express trains and are completely signaled, and three track lines, the middle track of which is in most cases signaled for the movement of trains in both directions. On these middle tracks the trains usually run toward the business district in the morning and in the opposite direction in

TABLE A—AUTOMATIC BLOCK SIGNALS INSTALLED IN 1918*—(Continued)

Name of Road	Miles of Road S.T. D.T.	From	To	No. of Signals	Type of Signals	Control System	Remarks
Maine Central	5	Fairfield	Clinton	10	.....	D. C.	Changed from S. T. to D. T.
Michigan	3	Conners	Snell	4	3-pos. a. c.	"T. D. B."	Union.
N. Y. Central (Eastern) ..	9	Schuyler J.	Little Falls ..	18	Hall, normal d. ....	.....	Third and fourth tracks.
.....	4	Poughkeepsie ..	.....	12	Hall, normal d. ....	.....	Revision; four-track.
.....	1	.....	.....	.....	Hall, normal d. ....	.....	Short sections.
C., C. & St. L.	20	Middletown	Dayton	32	.....	.....	.....
.....	11	Lenox	Bridge Junc.	9	Union "B" and "T 2" ..	.....	One-track signaled.
.....	4	Galion	Crestline	4	.....	.....	.....
.....	1	Sedansville	Storrs	1	.....	.....	.....
Michigan Central ..	8	Paine's	Mershon	28	Union "B" and "T 2" ..	Pole line .....	.....
.....	4	Hoyt, Mich.	Saginaw	18	Union "B" and "T 2" ..	Pole line .....	.....
Pittsburgh & L. E.	5	Struthers, O.	Youngstown ..	14	Union "T 2" 3-pos.	A. C.	For L. E. & Eastern R. R.
New York Connecting.	6	Oak Point	Woodside	10	Union "S" 3-pos.	U. Q. A. C.	Left-hand quadrant; suspended.
N. Y., N. H. & H.	5	New Rochelle, N. Y.	Woodlawn	23	Union "S" 3-pos.	U. Q. A. C.	Left-hand quadrant; suspended; replacing controlled manual; four-track.
.....	18	Braintree, Mass.	Greenbush	46	G. R. S. "2 A" 3-pos. ....	.....	.....
Norfolk & Western.	50	Atkins, Va.	Bristol	92	U. Q.	A. C., 220 volt.	Left-hand quadrant.
.....	2	N. Roanoke	Roanoke	5	3-pos. a. c. U. Q.	A. P. B. ....	.....
.....	11	W. Vivian	Farm	19	3-pos. d. c. U. Q.	Polarized t. ckt. ....	.....
Northern Pacific	17	Rice, Minn.	Little Falls ..	22	3-pos. a. c. U. Q. ....	.....	To replace d. c. signal.
.....	92	Toston, Mont.	Garrison	162	G. R. S. "2 A"	A. P. B.	Replaces manual system.
.....	7	Missoula	De Smet	11	G. R. S. "2 A" .....	.....	Part to replace manual.
.....	71	De Smet	St. Regis	117	G. R. S. "2 A"	A. P. B. ....	.....
.....	22	St. Regis	Paradise	37	G. R. S. "2 A"	A. P. B. ....	.....
Pennsylvania	24	Easton, Wash.	Lester	38	G. R. S. "2 A"	A. P. B. ....	.....
.....	7	N. Philadelphia ..	Chestnut Hill ..	27	Position-light	A. C. track ckts. ....	.....
.....	7	Selinsgrove J.	Northumberland	29	Position-light	A. C. track ckts.	Union; includes 14 interlocked signals.
.....	2	Sch. River	N. Philadelphia ..	13	Position-light	A. C. track ckts.	Four-track = 8 miles of track.
.....	4	Rahway	S. Elizabeth	24	Position-light	A. C. track ckts.	Six-track = 21 miles of track.
N. Y., Phil. & N.	31	Camden	Haddonfield	19	Position-light	A. C. track ckts.	Union.
.....	31	Delmar	Pocomoke	42	Position-light	A. C. track ckts.	G. R. S. Replaces manual.
Penna., W. of Pittsburgh	2	Fort Wayne	G. R. & I. Junc.	6	Position-light	A. C. track ckts.	Union replaces manual.
.....	6	Indianapolis	Ben Davis	22	Position-light	A. C. track ckts.	Replacing manual.
.....	4	Miller, O.	Jewett	7	Position-light	A. C. track ckts.	Replacing manual.
Pere Marquette	26	S. Lyon	Fowlerville	34	3-pos., U. Q.	D. C. polarized. ....	.....
.....	18	Riverside	Gross	25	3-pos., U. Q.	D. C. polarized. ....	.....
.....	13	Grand J.	Fennville	14	3-pos., U. Q.	D. C. polarized. ....	.....
Southern	97	Spartanburg, S. C.	Toccoa, Ga.	126	3-pos., U. Q., N. C. A. C.	A. C. track .....	.....
Alabama & Vicksburg	7	Champion Hill ..	Smiths	15	Union "S"	D. C. track .....	.....
Cin., N. O. & Tex. P.	13	Science Hill	Fishing Creek ..	21	3-pos., U. Q.	A. C. track .....	.....
.....	9	Moreland	South Fork	12	3-pos., U. Q.	D. C. track .....	.....
Southern Pacific	5	Edgewood, Cal.	Metcalf	9	.....	.....	Union.
.....	2	Stockham, Ariz.	Tucson	14	.....	.....	Union.
So. Pacific (No. of Ash-land)	9	Walker, Ore.	Goshen	12	Union "B"	D. C. ....	.....
Galveston, H. & S. A.	9	Eureka	West Junction ..	15	Union "B"	L. Q.	Switch indicators.
.....	7	San Antonio	Withers	12	Union "B"	L. Q.	Switch indicators at some switches.
Hous. & Tex. Cen.	4	Houston .....	.....	4	Union "B"	L. Q.	Junction of H. E. & W. T. and T. & N. O.
Union Pacific	18	Burns, Wyo.	Archer	66	Union "B" 2-pos., L. Q. ....	.....	Two-arm (home and dist.).
.....	20	Manhattan, Kan.	Junction City ..	83	Union "B" 2-pos., L. Q. ....	.....	Two-arm (home and dist.).
.....	4	Dale Creek, Wyo.	Hermosa	18	Union "B" 2-pos., L. Q. ....	.....	Two-arm (home and dist.).
Oregon Short Line.	14	Pocatello	Fort Hall	36	G. R. S. "2 A" 2-pos., L. Q., bottom-post mech.	Track and wire, d. c. ....	.....
.....	.....	Pocatello	Huntington	11	Union "B" .....	.....	Revisions.
.....	.....	Granger	Pocatello	12	Union "B" .....	.....	Revisions.
Oregon-W. R. & N. Co.	2	Kamela, Ore.	Hanlon	5	.....	Polarized	G. R. S.
Union Trac. Co., Ind.	15	Broad Ripple	Noblesville	15	Light	A. P. B. 55-volt.	G. R. S.
Wash., Balt. & A.	36	Baltimore	Dist. Columbia ..	38	Light, 3-pos. ....	.....	Union.
Western Maryland	10	Big Pool	Clear Spring	7	Union "S"	Polarized	S. T. changed to D. T.
Total	1009	798	.....	.....	.....	.....	.....
Canada							
Canadian Government ..	4	Newcastle	Derby Junc.	7	Top post	A. P. B. ....	.....
Canadian Pacific	2	Pasqua .....	.....	2	G. R. S. "2 A" .....	.....	.....
.....	3	Java .....	.....	3	G. R. S. "2 A" .....	.....	.....
.....	3	Rosser .....	.....	1	G. R. S. "2 A" .....	.....	.....
.....	3	Poplar Pt. ....	.....	1	G. R. S. "2 A" .....	.....	.....
.....	2	Virdin .....	.....	1	G. R. S. "2 A" .....	.....	.....
.....	2	Ft. William .....	.....	1	G. R. S. "2 A" .....	.....	.....
Grand Trunk	1	Point Claire, Que.	.....	1	G. R. S. "2 A" .....	.....	.....
.....	1	St. Bruno, Que. ....	.....	1	Hall "K" .....	.....	.....
.....	1	Scarboro Junc. ....	.....	2	G. R. S. "2 A" .....	.....	.....
.....	1	Beamsville .....	.....	1	G. R. S. "2 A" .....	.....	.....
.....	1	St. David's .....	.....	1	G. R. S. "2 A" 3-pos. ....	.....	.....
Total	6	18	.....	.....	.....	.....	.....

*In tables A, B and C the column headed "double track" includes also the mileage of three-track and four-track lines. In these tables the name of the maker of signal apparatus, where it has been given, is shown in the last column: Federal; G. R. S. (General Railway Signal Company); Hall; Union (Union Switch & Signal Company).

New York, New Haven & Hartford: The 69 semaphore signals have high power electric lights giving indications not only at night but also in the daytime.

the afternoon. Automatic train stops are used in connection with all automatic block signals on this road. Express tracks and middle tracks are equipped with automatic block signals at suitable intervals to allow the running of trains three blocks apart, under a headway of 90 seconds. Approaching the stations on express tracks automatic block signals with automatic train stops are placed very close together so as to constitute a system limiting the speed of trains.

In Canada very little automatic block signal work has been completed during the past year.

Block Signals Now Under Construction

Only three roads reporting have over 100 miles of automatic block signals under construction on December 31, 1918. The Atchison, Topeka & Santa Fe has under construction 172 miles of single track and 116 miles of double track signaling, on which 468 signals will be used. The

TABLE B—AUTOMATIC BLOCK SIGNALS UNDER CONSTRUCTION DECEMBER 31, 1918*

Name of Road	Miles of Road	S.T.	D.T.	From	To	No. of Signals	Type of Signals	Control System	Remarks
Atchison, T. & S. Fe...	4	Camden, J.	Floyd	6	Union "S"	6	Union "S"		
	13	Eldorado	Augusta	18	Union "S"	18	Union "S"		
	26	Winfield J.	Newkirk	46	Union "S"	46	Union "S"		
	5	Glorietta	Decatur	8	3-pos. U. O.	8	3-pos. U. O.		
	3	Hutchinson	Kent	6	3-pos. U. O.	6	3-pos. U. O.		
	27	Goffs	Danby	30	3-pos. U. O.	30	3-pos. U. O.	A. C., polarized	Union.
	38	Danby	Bagdad	51	3-pos. U. O.	51	3-pos. U. O.	A. C., polarized	
	54	Christie	Stockton	98	3-pos. U. O.	98	3-pos. U. O.	D. C., polarized	
	118	Larson	Fresno	211	3-pos. U. O.	211	3-pos. U. O.	D. C. Polarized	
Gulf, Col. & S. Fe.	1	Lindsay	Arbuckle	10	Union "S"	10	Union "S"	A. P. B.	
	13	Hogansv. Ga.	La Grange	15	Union "B"	15	Union "B"	Polarized	
Atlanta & W. P.	6	Falling Creek, Va.	James River	11	Union "S"	11	Union "S"		
Atlantic Coast Line	10	Foley, Pa.	Manila, Pa.	16	Union "T 2"	16	Union "T 2"		
Baltimore & Ohio	32	Sand Patch	Confluence	42	Union "T 2"	42	Union "T 2"		Three-track Automatic Replacing manual.
Balt. & Ohio (Western)	12	Willard	Greenwich	21		21		D. C.	Normal clear.
	4	Erie J.	No. Lima	15		15		D. C.	Normal clear.
Boston Elevated	1	Sullivan Sq.	Everett	12	Light, 3-pos.	12	Light, 3-pos.	A. C.	
Brooklyn R. T. Co.	7	New York		129	Color-light	129	Color-light	A. C.	Overlap control; automatic train stops; time-control approaching stations and on steep descending grades; includes one mile of 4-track; four miles middle track with traffic direction locking; G. R. S. apparatus.
Chesapeake & Ohio	12	Silver Grove	Cincinnati	38	Union "B," 3-pos.	38	Union "B," 3-pos.		Revision.
	21	Charlottesville	Gordonsville	56	3-pos. light	56	3-pos. light	D. C.	Includes 57 ramps for automatic train control on 15 miles of line.
Chicago, B. & Quincy	52	Princeton, Ill.	Wataga	242	Top post, l. q. 60 deg.	242	Top post, l. q. 60 deg.		
	11	Dietz, Wyo.	Ranchester	31	Top post, l. q. 60 deg.	31	Top post, l. q. 60 deg.		
Chicago, Mil. & St. P.	12	Junction	Milbank, S. D.	13	3-pos.	13	3-pos.	D. C.	
	98	Othello, Wash.	Cle Elum	136	Color-light, 3-pos.	136	Color-light, 3-pos.		
	72	Cle Elum	Maple Valley	101	Color-light, 3-pos.	101	Color-light, 3-pos.		
	28	Black River	Tacoma	48	Color-light, 3-pos.	48	Color-light, 3-pos.		
Chicago, R. I. & Pac.	6	Topeka	Bishop	14	Union "S"	14	Union "S"	Polarized	Changed from S. T. to D. T.
	9	Paxico	McFarland	9	Union "S"	9	Union "S"	Polarized	Changed from S. T. to D. T.
El Paso & S. W.	19	Forrest, Ariz.	Lee	40	Hall "K" 3-pos.	40	Hall "K" 3-pos.	U. O. Normal clear	Traffic direction.
Illinois Central	29	Gilman, Ill.	Gibson City	50	Hall "L" 3-pos.	50	Hall "L" 3-pos.	U. O. Normal clear	Traffic direction.
	71	Springfield, Ill.	Marine	128	Hall "K" 3-pos.	128	Hall "K" 3-pos.	U. O. Normal clear	Traffic direction.
	12	Vaughan, Miss.	Canton	20	Hall "K" 3-pos.	20	Hall "K" 3-pos.	U. O. Normal clear	Traffic direction.
	21	Canton	Asylum	40	Hall "L" 3-pos.	40	Hall "L" 3-pos.	U. O. Normal clear	Traffic direction.
	21	Isley, Ky.	Princeton	43	Hall "L" 3-pos.	43	Hall "L" 3-pos.	U. O. Normal clear	Traffic direction.
Yazoo & M. V.	7	Memphis	State Line	4	Hall "L" 3-pos.	4	Hall "L" 3-pos.	U. O. Normal clear	Traffic direction.
	9	State Line	Cormorant	15	Hall "L" 3-pos.	15	Hall "L" 3-pos.	U. O. Normal clear	Traffic direction.
Interboro R. T. Co. (N.Y.)	43	Lake Cormorant	Coahoma	62	Hall "L" 3-pos.	62	Hall "L" 3-pos.	U. O. Normal clear	Traffic direction.
	15			307	Light	307	Light		Aggregate of four lines in Manhattan and Brooklyn; includes 7 miles of middle track signaled in both directions.
Louisville & N.	16	Maplewood	Breunwood						
	17	Jackson, Ky.	Oakdale						
Missouri, Kan. & Tex.	136	Henderson, Ky.	Amqui						
New York Central	7	Labette, Kan.							
	7	William St.		17	Hall	17	Hall	Normal d.	
Kanawha & Mich.		Little Falls	St. Johnsville	16	Hall	16	Hall	Normal d.	Third and fourth tracks.
		Elk River Bridge		2	Light, 2-color	2	Light, 2-color		G. R. S.; gauntlet.
		Langsville, Ohio		2	Light, 2-color	2	Light, 2-color		G. R. S.; gauntlet.
New York, N. H. & H.	16	Hopewell Junc.	Polmes	34	Union "S," low v.	34	Union "S," low v.	Polarized	
Central New Eng.	10	Pitts'gh, 12th St.	Thomson	34	Position-light	34	Position-light	See note	
Pennsylvania	6	Mansfield	Toledo, J.	6		6			New third-track.
Penna., W. of Pittsburgh	2	Alliance	Massillon	38		38			New third and fourth tracks.
	17	Leetonia	Alliance	19		19			New third-track.
Pere Marquette	67	Fowlersville	Elmsdale	90	3-pos. U. O.	90	3-pos. U. O.	D. C.	
	23	Grand Rapids	Waverly	43	3-pos. U. O.	43	3-pos. U. O.	D. C.	
Philadelphia & Reading	1	Del. River		6	Union, U. O., top-post.	6	Union, U. O., top-post.	A. C., Normal d.	
	2	Trenton Junc.	Wilmington	9	Union, U. O., top-post.	9	Union, U. O., top-post.	A. C., Normal d.	Three-track.
	19	Glenmoor	Manville	86	Union, U. O., top-post.	86	Union, U. O., top-post.	A. C., Normal d.	Four-track = 74.4 miles of track.
Southern	1	Manville	B. Brook J.	3	Union, U. O., top-post.	3	Union, U. O., top-post.	A. C., Normal d.	
	76	Charlotte	Spartanburg	96	3-pos. U. O.	96	3-pos. U. O.	A. C.	
Alabama G. S.	9	Toccoa, Ga.	New Switzerland	8	3-pos. U. O.	8	3-pos. U. O.	A. C.	
	21	Burstable, Ala.	Vance	12	3-pos. U. O.	12	3-pos. U. O.	D. C.	Revision.
	7	B. A.	Russel Junc.	12	3-pos. U. O.	12	3-pos. U. O.	D. C.	
Cin., N. O. & T. P.	17	Helenwood		32	3-pos. U. O.	32	3-pos. U. O.	D. C.	
Southern Pacific	2	Hilt, Cal.		4		4			Union.
	2	Folsom, Cal.		4	Light	4	Light		Union.
So. Pacific (N. of Ashland)	11	Kern Junc.	Sivert						Addition for second main track.
	5	Oswego, Ore.	Jean	11	Light	11	Light	A. C.	
Galveston, H. & S. A.	12	El Paso	Ysleta	26	Union "B" 2-pos. l. q.	26	Union "B" 2-pos. l. q.	Polarized, wireless	Switch indicators.
Wabash	24	Lafayette, Ind.	Clymers	30	Bottom-post	30	Bottom-post	Polarized	S. T. changed to D. T.
Western Maryland	14	Williamsport	Clear Spring	12	Union "S"	12	Union "S"	Polarized	
Total	938			577					
Canada									
Canadian Government	5	Fairview	Halifax	10		10		Polarized	
Canadian Pacific	2	Winnipeg		1	G. R. S. "2 A"	1	G. R. S. "2 A"		
	3	Whytewold		2	G. R. S. "2 A"	2	G. R. S. "2 A"		
	2	Bradbury		1	G. R. S. "2 A"	1	G. R. S. "2 A"		

Illinois Central is installing 204 miles of single track and 9 miles of double track signals with a total of 362 signals. The Chicago, Milwaukee & St. Paul is installing 198 miles of single track and 12 miles of double track signals using a total of 298 signals. Of this mileage 198 miles of single track is in the electrified territory in Montana, where signals of the three position a. c. color light type are used.

The Chesapeake & Ohio has under construction 21 miles of single track and 12 miles of double track signaling, using 94 signals. In connection with this work automatic stops are being installed, including 57 ramps for automatic train control on 15 miles of the line (single track). The Interborough Rapid Transit will install 307 light signals on its lines in Manhattan and Brooklyn, including 7 miles of middle track to be signaled in both directions.

Block Signaling Proposed

Of the work proposed for 1919, six lines expect to install more than 100 miles of automatic block. The Northern Pacific proposes to install 360 signals on 213 miles of single track; the Kanawha & Michigan will install 150 miles of single track signals and 13 miles of double track automatic block using a total of 210 signals; the Chicago, Milwaukee & St. Paul will install 127 miles of single track and 17 miles of double track signals using 261 signals; the Cleveland, Cincinnati, Chicago & St. Louis will install 124 miles of

double track signaling using 200 signals; the Great Northern will install 17 miles of single track signals using 217 signals, and the Chesapeake & Ohio will install 98 miles of single

TABLE D—MANUAL BLOCK SIGNALING INSTALLED IN 1918

	Miles
Atchison, Topeka & S. F., San Diego, Cal., to Camp Kearney.....	27
Long Island—Hicksville to Pinelawn.....	7
Floral Park to Garden City.....	3
New York, Chicago & St. Louis—Brocton to Buffalo.....	47
New York, New Haven & Hartford—Berlin, Conn., to Middletown..	10
Pennsylvania W. of Pittsburgh—Frankfort, Ind., to Ben Davis.....	41
Total.....	135

All of the foregoing is single-track line except the Long Island items, which are double track, and the N. Y. C. & St. L., which consists of 39 miles of double track, and 8 miles three-track line. The New Haven installation is operated by the electric train staff.

TABLE F—MANUAL BLOCK SIGNALING PROPOSED FOR 1918

	Miles
Texas & Pacific—Fort Worth to Baird (single track).....	140

track and 15 miles of double track work using a total of 134 signals.

Manual Block Signaling

Table D, covering manual block signaling completed during the year, shows a total of 78 miles of single track, 49 miles of double track and 8 miles of three track lines which have been equipped with this type of signaling. The New Haven road's installation is operated by the electric train

TABLE C—AUTOMATIC BLOCK SIGNALS—PROPOSED NEW CONSTRUCTION, 1919*

Name of Road	Miles of Road	S.T.	D.T.	From	To	No. of Signals	Type of Signals	Control System	Remarks
Atchison, T. & S. Fe...	7	5		Ramsey	Eldorado	7	Union "S" U. Q.	D. C.	
	2			Norfolk	Cushing	10	Union "S" U. Q.	Polarized	
	12			Caney	Owen	13	Union "S" U. Q.	Polarized	
	3			Ochelata	Bartlesville	20	Union "S" U. Q.	Polarized	
Atlanta & West Point...	1			Escondido	Fall Brook	10	Union 3-pos., U. Q.	Polarized	
Baltimore & Ohio	1			La Grange, Ga.	Montgomery, Ala.	119			
	1			Laughlin J.	Schenley	15	Union "T 2"	D. C.	Replacing manual.
	35			Pittsburg, 33d St.	Pine Creek	4	Union "T 2"	D. C.	Replacing manual.
B. & O. Chic. Term.	2			Willow Grove	Goehring	68	Union "T 2"	D. C.	Replacing manual.
				Chicago		3			Aggregate of three sections; one take-siding indicator.
Boston & Maine	1			Kittery, Me.	Navy Yard	5			
	32			N. Cambridge	Clinton J.	74			
Brooklyn R. T. Co.	7			Brooklyn, N. Y.		129			Aggregate of three sections.
Chesapeake & Ohio	98			Russell, Ky.	Greenup	20	Union "B"	D. C.	3-pos., to take place of 2-pos.
				Charlottesville	Clifton Forge	98		A. C.	
Chicago & W. Ind.	8			Richmond	Westham	16			
Chicago, Mil. & St. P.	15			Twelfth St.	Eighty-first St.	16	A. C.	D. C.	To replace manual; 21 miles t'k.
	2			Savanna, Ill.	Green Island	16	Top-post, 3-pos.	D. C.	Replacing 2-pos.
	5			Milwaukee	Grand Ave.	10	Top-post, 3-pos.	D. C.	Replacing 2-pos.
	122			Sioux City		15			
				Mobridge, S. D.	Hettinger	220	Bottom-post, 3-pos.	D. C.	These signals were formerly in service on the electrified section of the road, which now has light signals.
Chicago, N. S. & Mil.	1			Howard Ave.		4	Union "M"	A. C.	
Chicago, R. I. & Pac.	6			Tindall, Mo.	Trenton, Mo.	12	Union "S"	D. C.	Addition for second track.
	4			Peoria, Ill.		12	Color-light	A. C.	Including yard.
Cumberland Valley	11			M. R.	Shippensburg	24			
Erie	37			Jefferson J.	Carbondale	71			Road operated by D. & H. Co.
	6			Griffith	Hammond	13			Op. jointly; Erie and C. & O.
Ft. Dodge, D. M. & S.	7			Kelley	Ames	8			
Great Northern	41			Newport, Wash.	Hillyard	80	G. R. S. "2 A"	A. P. B.	
	23			Wenatchee	Leavenworth	47	G. R. S. "2 A"	A. P. B.	
	53			Skykomish	Everett	90	G. R. S. "2 A"	A. P. B.	
Interboro R. T.	5			Fordham Rd.	Gunhill Road	9	Light		Three-track line.
New York Central	63			Crestline	Berea	100		D. C.	
C., C. & St. L.	61			Pana	Lenox	100	Color-light, 3-pos.	D. C.	
Kanawha & Mich.	150			Corning, O.	Gauley Bridge	210	Color-light, 3-pos.	A. P. B. on S. T.	
Toledo & O. C.	11			New Lexington	Corning	22	Color-light	A. P. B.	
New York N. H. & H.	28			Boston Switch	Readville	95		A. C.	To replace controlled manual.
Norfolk & Western	4			Clare	Ancor	16	3-pos. U. Q.	A. P. B.	
Northern Pacific	213			Glendive, Mont.	Huntley	360	G. R. S. "2 A"	A. P. B.	
N. W. Pacific	2			Almonte	Mill Valley	4	Light	A. C.	Union.
Pennsylvania, W. of Pitts	5			Clymers	Logansport	13			Replacing manual.
	55			Rochester, Pa.	Bayard				Replacing manual.
	23			Ingram, Pa.	Dinsmore				Replacing manual.
	2			Ashland Ave.	Western Ave.	6			Replacing manual; four-track.
	7			Collier's, W. Va.	Wh. Junction				Replacing manual; three-track.
	21			Jewett, Ohio	Uhrichsville				Replacing manual; three-track.
Philadelphia & Reading	8			Eastwick	Darby Creek	21	Inclosed disk	D. C.	Hall N. D.
Southern Pacific									
Houston & Tex. Cen.	12			Hempstead	Courtney		Union "B"		
Terminal R. R. Assn.				St. Louis		6	G. R. S. "2 A"	D. C.	Less than one mile.
Terre Haute, I. & E.	14			Plainfield, Ind.		12		G. R. S., A. P. B.	
Texas & Pacific	5			Dallas	Eagle Ford				
Union Pacific	27			Le Roy, Wyo.	Evanston, Wyo.	112	Union "B" 2-pos. L. Q.		Two-arm; 112 blades.
Oregon Short Line				Various		20	Union "B" 2-pos. L. Q.		Revision.
Wabash	6			Mitchell	Granite City	9	Bottom-post	Polarized	
Total	820	478							
Canada									
Canadian Pacific	2			Engen		1			
	2			Harfield		1			

TABLE G.—INTERLOCKING PLANTS COMPLETED IN 1918*

1	2	3	4		5
			No. of working levers		
Road	Plants	Character	Mechanical	Electric	
Atchison, Topeka & Santa Fe..	6	C.	12	49	
..	..	J.	28	..	
..	..	M.	..	11	
Atlantic Coast Line.....	8	Y.	50	..	
..	..	C.	11	*	
..	..	D.	25	*	
Baltimore & Ohio.....	12	J.	16	..	
..	..	E. D. T.	..	52	
..	..	E. T. T.	16	..	
..	..	J.	151	7	
B. & O.—Western Lines.....	3	M.	51	..	
..	..	C.	46	..	
B. & O., Chicago Terminal.....	1	C. J.	13	..	
Boston & Maine.....	1	C.	25	..	
Boston Elevated.....	1	Y.	10	..	
Brooklyn Rapid Transit Co....	3	T.	..	4	
..	..	C. T.	..	22	
..	..	X.	..	57	
Central of Georgia.....	1	C.	92	..	
Central of New Jersey.....	2	E. F. T.	46	..	
Chesapeake & Ohio.....	2	C.	18	..	
..	..	X.	10	*	
Chicago & Alton.....	1	C.	24	..	
Chicago, Burlington & Quincy..	6	J. D.	..	34	
..	..	C.	..	60	
..	..	T.	24	..	
..	..	J.	12	..	
Chicago, Milwaukee & St. Paul.	5	D.	10	..	
..	..	J.	152	..	
..	..	C.	3	..	
Chicago, North Shore & Mil....	1	Y.	..	25	
Delaware, Lack. & Western....	1	C.	94	..	
Detroit United.....	5	D.	..	7	
Duluth, M. & N.....	1	C.	11	..	
Duluth, S. S. & A.....	1	C.	14	..	
Great Northern.....	2	E. D. T.	15	..	
..	..	C.	13	..	
Illinois Central.....	2	J.	..	53	
..	..	D.	8	..	
Yazoo & Mississippi Valley..	2	J.	21	..	
..	..	C.	16	..	
Illinois Traction System.....	1	J.	..	444	*
Interboro R. T. Co. (N. Y.)...	..	J.	32	..	
Long Island.....	1	E. D. T.	3	..	
Maine Central.....	1	J.	22	..	
..	..	C.	23	..	
Portland Terminal.....	1	J.	25	..	
Missouri, Kansas & Texas.....	1	X.	86	..	
New York Central.....	5	S.	46	..	
..	..	T.	44	..	
..	..	C. J.	..	45	
Cleve., C. C. & St. Louis..	2	E.	21	..	
..	..	E. F. T.	18	..	
Michigan Central.....	1	Y.	16	..	
New York, New Haven & Hart.	4	J.	19	..	
..	..	E. D. T.	36	44	
..	..	C.	14	..	
Central New England.....	2	C.	36	..	
Northern Pacific.....	3	C.	12	23	
Pennsylvania.....	16	J.	8	..	
..	..	M.	120	134	
..	..	C.	42	..	
New York, Phila. & N....	3	D.	4	7	
..	..	J.	17	..	
Penna. W. Pitts.....	3	C.	39	..	
..	..	J.	33	..	
..	..	Y.	14	..	
Pere Marquette.....	1	E.	13	..	
Richmond, F. & P.....	1	..	..	?
San Francisco-Oakland.....	1	C.	..	..
St. Louis-San Francisco.....	1	..	..	..
Seaboard Air Line.....	5	C.	12	..	
..	..	D.	12	..	
Southern.....	8	C.	59	..	
..	..	D.	4	..	
..	..	J.	29	..	
..	..	M.	8	..	
Southern Pacific.....	4	J.	20	63	
Galveston, H. & S. A.....	1	D.	7	..	
Houston & T. C.....	2	C.	8	29	
Louisiana Western.....	1	D.	4	..	
Texas & N. O.....	1	C.	20	..	
Union Pacific.....	2	C.	11	..	
..	..	E. D. T.	6	..	
Oregon Short Line.....	1	J.	2	..	
Wabash.....	..	..	..	..
Washington, Balt. & A.....	1	C. Y.	..	52	
Total.....	142	.....	1,982	1,222	
Canada					
Grand Trunk.....	1	E.	6	..	

*In tables G, H and I a number of electro-mechanical plants (indicated by a star) have been reported without a separation of the electric from the mechanical levers; in which cases the number in the first column includes all of the levers of both kinds. In these three tables the number of plants entered against the name of each road represents the total reported by that road.

ABBREVIATIONS IN TABLES G, H AND I

C.—Crossing.	J.—Junction.
D.—Drawbridge.	M.—Miscellaneous and unclassified.
E.—Electric ry. crossing.	S.—Station.
E. D. T.—End of double track.	T.—Terminal.
E. F. T.—End of four track.	X.—Crossovers.
E. T. T.—End of third track.	Y.—Yard.

staff. The total of 135 miles installed compares with 301 miles a year ago, which would indicate that railroad officers are recognizing more and more the value of the automatic system as compared with the manual.

Table F, representing new manual block signaling proposed for 1919, shows that one road expects to install a total of 140 miles of single track manual block.

New Interlocking Completed

The figures in table G are to be taken as an exhibit of work done rather than as showing the precise amount in the increase of interlocking apparatus in use in the country. A considerable portion of the items represent the reconstruc-

TABLE H.—INTERLOCKING PLANTS UNDER CONSTRUCTION, DECEMBER 31, 1918*

	1	2	3	4	5
				No. of working levers	
	Road	Plants	Character	Mechanical	Electric
Alton & Southern.....		1	C.	29	..
Atchison, Topeka & Santa Fe..		6	E. D. T.	17	..
		..	J.	5	..
		..	M.	28	..
		..	X.	20	..
Atlantic Coast Line.....		4	C.	12	..
		..	D.	5	..
		..	J.	12	..
Baltimore & Ohio.....		7	J.	46	83
		..	F. D. T.	17	..
		..	M.	41	..
		..	T.	..	47
Balt. & Ohio (Western).....		4	J.	78	..
Balt. & Ohio, Chicago Terminal.		1	J. C.	91	..
Boston & Maine.....		3	C.	..	71
		..	J.	16	..
Boston Elevated		2	J.	..	37
		..	T.	..	4
Brooklyn Rapid Transit Co....		7	D. T.	..	74
		..	T.	..	41
		..	X.	..	171
Buffalo, R. & P.....		1	J.	..	..
Central of Georgia.....		1	..	..	..
Chesapeake & Ohio.....		11	C.	34	..
		..	J.	70	84
		..	X.	44	..
		..	C.	15	..
Chicago & Alton.....		1	J.	29	..
Chicago, Milwaukee & St. Paul.		1	E. D. T.	11	..
Chicago, R. I. & Pacific.....		1	E.	18	..
Detroit United.....		1	..	94	..
Interboro R. T. Co.....		8	..	75	122
Jacksonville (Fla.) Terminal..		3	..	18	..
Lehigh Valley		2	J.	..	28
		..	J.	..	54
Louisville & Nashville.....		2	C.	36	..
Missouri Pacific		1	J.	68	..
New York Central (East).....		6	T.	80	..
		..	X.	53	..
		..	X.	..	116
		..	T.	16	..
Cleve., C. C. & St. Louis..		1	Y.	..	99
Pittsburgh & Lake Erie....		2	T.	17	11
New York, New Haven & Hart.		3	D. J.	..	42
		..	X.	15	15
Penn. W. Pitts.....		3	J.	..	40
		..	D. Y.	66	..
Pennsylvania.....		20	C.	8	19
		..	D.	..	83
		..	T.	36	38
		..	X.	88	156
Philadelphia & Reading.....		17	C.	45	54
		..	J.	70	87
		..	Y.	16	35
		..	Y.	..	43
Richmond (Va.) Terminal.....		1	T.	..	40
St. Louis Merchants Bridge....		1	C.	..	35
Seaboard Air Line.....		2	C.	10	..
		..	D.	3	..
Southern		2	C.	..	35
		..	J.	12	..
		..	C.	24	..
Galveston, H. & S. A.....		3	M.	16	..
		..	E. D. T.	10	..
Morgan's L. & T.....		1	C.	10	..
Texas & N. O.....		2	C.	9	..
Union Pacific		2	D.	24	..
		..	C.	..	..
Total		135	.....	1,604	1,642

*See note under Table G.

tion of old plants or important enlargements to provide new tracks or rearrangement of tracks, rather than the construction of entirely new plants. Also some duplications necessarily occur, as a joint plant may be reported by two or more roads. The same observations also apply to tables H and I.

From the returns received, the largest electric interlocking plant completed during the year is one with 60 working

levers located at LaVergne, Ill., on the Chicago, Burlington & Quincy. The Illinois Central completed a plant with 53 working levers at Pullman Junction, Chicago, while the Central of Georgia placed in service an electric plant of 92 working levers at Macon. This, however, consisted of the reconstruction and enlargement of an existing plant.

Electro-pneumatic interlocking plants have been installed on four lines; a 25-lever plant on the Delaware, Lackawanna & Western, at Orange, N. J.; one of 18 levers on the Southern Pacific at San Francisco; Boston Elevated one of four levers, and the Interborough Rapid Transit installed no less than 35 plants with a total of 444 working levers. The

under construction, namely, the Boston Elevated, with one 37-lever and one 4-lever plant; the Baltimore & Ohio, with one 14 and one 30-lever plant; the Jacksonville (Fla.), Terminal, with one 122-lever plant; the Interborough Rapid Transit Company, with 8 plants ranging in size from 4 to 24 working levers, having a total of 94 working levers for all; the Pennsylvania, with one 83 and one 51-lever plant, at Philadelphia; the Philadelphia & Reading, with one push-button electro-pneumatic machine of 43 units, installed at Rutherford, Pa., yard, and the Richmond (Va.), Terminal, with one 40-lever plant.

The largest all-electric interlocking plant under construction is one of 74 working levers on the Brooklyn Rapid Transit at Coney Island Creek, protecting the terminal and drawbridge. The next largest is a 72-lever plant being installed at Rochester, N. Y., to replace a pneumatic plant on the New York Central.

The Atlantic Coast Line has one electro-mechanical plant under construction; the Chesapeake & Ohio has 7 electro-mechanical plants ranging in size from 12 to 38 working levers; the Jacksonville Terminal is installing one 48 working lever electro-mechanical plant; the Big Four has one 16-lever plant; the New York, New Haven & Hartford one 30 and one 28-lever plant, while the Philadelphia & Reading is revising one plant which will have 67 working levers; the Pennsylvania is installing 10 electro-mechanical plants ranging in size from 7 to 47 working levers each. The eight interlocking plants on the Interborough covered by the items in Table H are located on six different lines, namely, Third Avenue elevated; Nostrand Avenue, Brooklyn; Eastern Parkway line; White Plains Road line; Webster Avenue line; additions on the Fourth and Lexington Avenue line.

Interlocking Proposed for 1919

Column 5 in Table I shows electro-pneumatic plants proposed on four roads. The Union Railroad (Pittsburgh, Pa.), will install two plants on the Clairton branch. The Norfolk & Western will install one 12 and one 10-lever electro-pneumatic plant. The Interborough Rapid Transit is contemplating installing 11 electro-pneumatic interlocking plants ranging in size from 3 to 32 working levers, totalling 118 in all at various points on the Lexington Avenue, East Parkway, Nostrand Avenue, White Plains Road and Webster Avenue lines. The New York, New Haven & Hartford is contemplating the installation of an electro-pneumatic push-button machine at a hump yard in Boston, 32 units.

The Philadelphia & Reading is contemplating installing two electro-mechanical machines, one of 35 and the other of 29 working levers. The Big Four is contemplating the installation of a 34-lever electro-mechanical machine, while the Baltimore & Ohio has under consideration the installation of a 37-working lever machine.

The largest all-electric machine contemplated for 1919 is one at Hayford, Ill., on the Belt Railway of Chicago, which is to have 168 working levers. The next largest electric machine is to be located at the East New York Terminal on the Brooklyn Rapid Transit line, at Tower 'B' and is to consist of 136 levers, while the third largest is contemplated at East Penn Junction, on the Philadelphia & Reading, 96 working levers.

The American Metric Association held its second annual meeting at Baltimore and Washington on December 27 and December 28. David A. Molitor, of Detroit, Mich., outlined his work for the C. E. Schmidt Company, tanners. He found that about 500 different commodities were being purchased for the use of this company and that they were recorded in many different units. By entering the weight or measure of everything in metric units marked economy was effected. The metric weights and measures were then used exclusively.

TABLE I.—NEW INTERLOCKING PROPOSED FOR 1919*

Road	Plants	Character	No. of working levers	
			Mechanical	Electric
Atchison, Topeka & Santa Fe..	4	E. D. T.	..	34
..	..	J.	24	..
Baltimore & Ohio.....	9	C.	12	..
..	..	E. D. T.	33	..
..	..	E. T. T.	37	..
..	..	E. F. T.	42	..
..	..	J.	89	..
Balt. & Ohio, Chicago Terminal.	2	M.	30	..
..	..	C.	16	..
Belt Railway, Chicago.....	1	J.	48	..
Boston & Maine.....	6	C.	32	168
..	..	J.	..	..
Brooklyn Rapid Transit Co....	8	Y.	..	178
..	..	T.	..	181
..	..	X.	..	20
..	..	M.	..	70
..	..	D.	..	16
Chicago, Milwaukee & St. Paul.	1	E. D. T.	35	..
Chicago, R. I. & P.....	3	C.	16	..
Chicago, Terre Haute & S. E..	1	C.	..	..
Cumberland Valley	1	C.	20	..
Great Northern	1	J.	6	..
Illinois Traction	1	C.	..	118
Interboro R. T.....	2	M.	12	22
Missouri, Kansas & Texas.....	2	C. J.	..	..
New York Central	2	C. J.	..	57
Cleve., C. C. & St. Louis..	2	C. J.	34	..
..	..	C. J.	12	..
Toledo & Ohio C.....	2	J.	20	..
..	..	C.	34	..
New York, Chicago & St. Louis	2	C.	102	10
..	..	X.	..	22
New York, New Haven & Hart.	3	D.	12	..
Norfolk & Western.....	2	C.	..	40
Northern Pacific	1	C.	..	46
Penna. W. of Pitts.....	2	J.	..	150
..	..	J.	64	..
Philadelphia & Reading	9	J.	37	..
..	..	J.	..	18
..	..	J.	..	40
San Francisco-Oakland T.....	1	J. Y.	..	..
Southern	2	D.	..	6
Alabama G. S.	2	J.	..	28
..	..	J.	45	..
Cin., N. O. & T. P.....	4	E. D. T.	..	16
..	..	E. D. T.	7	..
Texas & Pacific	2	C.	..	..
Union	2	E. D. T.	36	..
Union Pacific	4	T.	45	..
Wabash	2	D.	32	..
Total	80	.....	932	1,264
Canada				
Grand Trunk Pacific.....	1	C.	17	..

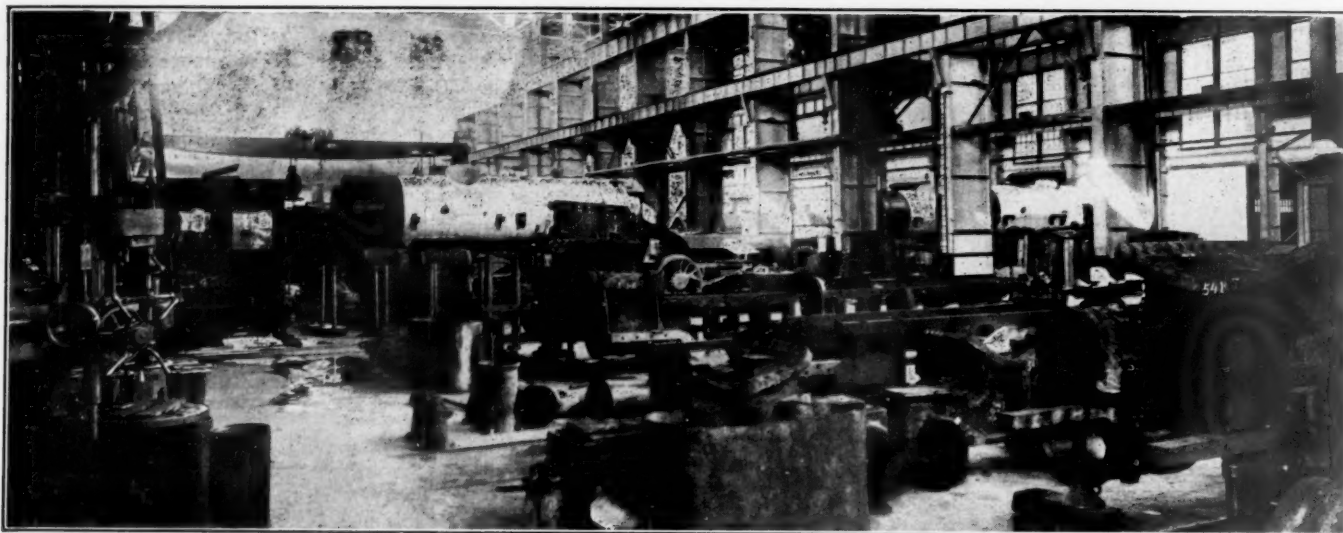
*See note under Table G.

largest of these was a 44-lever plant located at 180th Street, on the White Plains Road line. The plants ranged in size from 44 down to three working levers.

Nineteen electro-mechanical plants were installed, ranging in size from 6 to 43 working levers. One push-button electro pneumatic machine was completed during the year on the New York, New Haven & Hartford at the Cedar Hill (New Haven), hump classification yard, 44 units. The Southern Pacific installed one six-lever low voltage electric plant operated by interlocked circuit controllers at Stockham, Ariz., while a low voltage layout was put in on the Oregon Short Line at Pocatello, Idaho.

Interlocking Under Construction

Column 5 in Table G includes electro-pneumatic plants and contains data from seven roads on which such work is



Government Locomotive Orders Predominate in 1918

Railroad Administration and Director General Military
Railways Place Most of Year's Business

THE NUMBER OF LOCOMOTIVES reported as having been ordered during the 12 months of 1918 was 4,888, of which 2,802 were on domestic orders for companies in the United States and Canada, and 2,086 were on orders for shipments to other countries. These figures compare with a total in 1917 of 6,142, of which 2,704 were on domestic orders and 3,438 were for export, principally to the war zone in France.

The leading feature in the locomotive market during the past year, as in every other essential industry in the country, was, of course, the predominance of government orders. Of the 2,593 locomotives reported as having been ordered for service in the United States (that is, excluding the domestic orders for Canada), no less than 2,030 were included in the orders for standard locomotives placed by the United States Railroad Administration. Of the 209 locomotives ordered

in 1918, inclusive of the Canadian orders, as will be seen from Table II, was greater than last year but not as great as 1916. It was greater than the totals of domestic orders in 1914 and 1915, which were poor years. It was only about

Table II—Domestic Orders for Locomotives Since 1901

Year	Locomotives	Year	Locomotives
1901.....	4,340	1910.....	3,787
1902.....	4,665	1911.....	2,850
1903.....	3,283	1912.....	4,515
1904.....	2,538	1913.....	3,467
1905.....	6,265	1914.....	1,265
1906.....	5,642	1915.....	1,612
1907.....	3,482	1916.....	2,910
1908.....	1,182	1917.....	2,704
1909.....	3,350	1918.....	2,802

1,700 less than in 1912 and bears no comparison whatever to the big totals of 1905 and 1906. It is perhaps not necessary to refer in greater detail than this to the domestic figures, first, because there were so many foreign orders to bring up locomotive production, and, secondly, because the domestic situation is referred to in greater detail in another article on that subject elsewhere in this issue.

It is also interesting to observe that the orders for export were likewise not as great as in 1917. They bade fair to be much the same as those of that year, but the signing of the armistice put an end to the placing of further orders for the United States military railroads and resulted in cancellations of orders already placed, amounting to 1,500, in the latter part of November.

A Review of the Year

The whole situation in the locomotive market this year has been one of great uncertainty. It is not necessary to refer in detail to the causes for this that resulted from the standard locomotive program, inasmuch as the whole standardization question is referred to at great length in an article elsewhere in this issue, entitled "Has Locomotive Standardization Been Justified?"

It is worth while to sketch briefly what has taken place in the locomotive building industry during the past year. First, it will be noted that during the early months of the

Table I—The Locomotive Orders in 1918

Domestic—	
United States Railroad Administration.....	2,030
Other railroad orders.....	525
Industrials, etc.	38
Total United States.....	2,593
Canadian railroads	209
Total domestic	2,802
Foreign—	
Director General Military Railroads.....	1,404
Other foreign	682
Total foreign	2,086
Total of all orders.....	4,888

for roads in Canada 195, or practically all, were ordered by the Canadian government for the Canadian Government Railways.

Of the total of 2,086 locomotives ordered for export, no less than 1,404 were on orders for the United States military railroads, this figure excluding those orders that were cancelled after the signing of the armistice. The remainder of the orders for export also included a considerable number of locomotives for foreign governments—South Africa, England, Chili, China, Italy, etc.

The number of locomotives ordered for domestic service

year some 200 locomotives were placed on order by various railroads themselves, as will be seen from the appended lists of orders. The first standard locomotive order was placed by the United States Railroad Administration in April after extended discussion and totaled 1,025 locomotives, 555 being given to the American Locomotive Company and 470 to the Baldwin Locomotive Works. In June this was supplemented by an order for 390 locomotives, 245 to the American Locomotive Company, 100 to the Baldwin Locomotive Works and 45 to the Lima Locomotive Works, the last company being given an additional order for 15 locomotives in July, bringing the total of all orders at that time to 1,430,

Standard Locomotives Delivered to December 21.

Alabama & W. Point & Western Ry. of Ala.	2	0-8-0.....American
Atlantic Coast Line.....	5	0-6-0.....American
Baltimore & Ohio.....	50	Lt. 2-8-2.....Baldwin
Central of New Jersey.....	10	0-6-0.....American
Chicago & Alton.....	10	Hvy. 2-8-2.....American
Chicago Junction.....	14	Lt. 2-8-2.....American
Chicago & Eastern Illinois.....	15	0-6-0.....American
Chicago Great Western.....	10	Lt. 2-8-2.....American
Chicago, Milwaukee & St. Paul.....	50	Hvy. 2-8-2.....Baldwin
Cleveland, Cincinnati, Chicago & St. Louis.....	25	Lt. 2-8-2.....Baldwin
El Paso & South Western.....	5	Hvy. 2-8-2.....American
Erie.....	16	0-8-0.....American
Grand Trunk Western.....	15	Lt. 2-8-2.....American
Grand Trunk—East.....	15	Lt. 2-8-2.....American
Lake Erie & Western.....	15	Lt. 2-8-2.....Baldwin
Lehigh & Hudson River.....	4	Lt. 2-8-2.....Baldwin
Louisville & Nashville.....	20	Hvy. 2-8-2.....American
Michigan Central.....	20	Lt. 2-8-2.....American
Nashville, Chattanooga & St. Louis.....	10	Lt. 2-8-2.....American
New York Central.....	33	Lt. 2-8-2.....Lima
	25	0-8-0.....American
New York, Chicago & St. Louis.....	10	Lt. 2-8-2.....American
Pennsylvania Lines West.....	17	0-6-0.....American
Pittsburgh & West Virginia.....	3	Lt. 2-8-2.....Baldwin
Pittsburgh, McKeesport & Youghogheny.....	10	Hvy. 2-8-2.....American
Rutland.....	2	0-8-0.....American
Seaboard Air Line.....	4	Lt. 2-8-2.....American
Southern.....	20	0-6-0.....American
	29	Lt. 2-8-2.....American
Terminal R. R. of St. Louis.....	6	Lt. 2-10-2.....American
Texas & Pacific.....	11	0-6-0.....American
Toledo & Ohio Central.....	5	Lt. 2-8-2.....American
	15	0-8-0.....American
Union Pacific.....	20	Lt. 2-8-2.....American
Wabash.....	20	Lt. 2-8-2.....American
Western Pacific.....	5	Lt. 2-8-2.....Baldwin
Wheeling & Lake Erie.....	5	0-8-0.....American
	10	Hvy. 2-8-2.....American
Total—Six-wheel switching, American.....	56	
Eight-wheel switching, American.....	75	
Light Mikado, American.....	253	
Baldwin.....	112	
Lima.....	33	
Heavy Mikado, American.....	398	
Light Santa Fe, American.....	120	
	29	
Total to December 21.....	678	

orders having been placed so that all three companies were working on the standard designs.

Late in July, however, the Baldwin Locomotive Works, after having under way about 100 of the standard locomotives, all light Mikados, was given an order for 500 of the so-called "Pershing" locomotives for the military railroads in France and ceased production on the Railroad Administration engines to devote its entire energy to the new order. This was soon supplemented by additional orders for 10 and 500, respectively, and again in September by two orders of 500 and 1,000 respectively. The signing of the armistice removed the need for the last 1,500, and they were accordingly cancelled about the middle of November. Baldwin's production continued on the 250 or so "Pershing" locomotives remaining on the July orders.

The American and Lima companies prior to this had received additional orders for 500 and 100 standard locomotives, respectively, from the Railroad Administration. Following the signing of the armistice these orders were also held up for a time—and that to the utter consternation of the whole railway supply field—but were soon reinstated and definite contracts signed, bringing the total of all the stand-

ard locomotives placed to date by the Railroad Administration to 2,030. Of these orders there had been delivered to December 21, the latest date for which figures are available at this writing, 678 standard engines, including the 112 already referred to built by Baldwin, 33 from Lima and 543 from the American Locomotive Company. These details are given in one of the tables.

The First Gun and the Eleven Hundredth Engine

The Railroad Administration's standardization program has called for all kinds of adverse comment. It is only just to note here that it has been quite the opposite as far as the United States Military Railroad program is concerned. The department of which S. M. Felton has been the head, adopted standardization from the start, but it did not dally around for weeks and months as so many other of Mr. Baker's otherwise estimable departments did to reach that end. It adopted at the "first crack out of the box" a design that was being built at the Baldwin Locomotive Works for the British government, changed it to the extent principally of adding a superheater, managed to secure its first completed locomotive in 20 working days, and that design, with very minor changes, is still the one that is being produced at this writing, a year and one-half later. When the war ended with the signing of the armistice the American army in France had yet to receive its first American guns, its first tanks, its first airplanes. It was receiving, however, its eleven hundredth erected standard gage locomotive, and had received nearly a thousand more of smaller size.

Production in 1918

The total number of locomotives produced in 1918 was 6,475, including 3,668 on domestic orders and 2,807 on orders for the United States military railroads and for other railroads outside the United States and Canada. This total compares with a total of 5,446 in 1917, of which 2,585 were for

Table IV—The Locomotives Built

Domestic.....	3,668
Foreign.....	2,807
Total.....	6,475

Comparison with Previous Years							
Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896.....	866	309	1,175	1907*.....	6,564	798	7,362
1897.....	865	386	1,251	1908*.....	1,886	456	2,342
1898.....	1,321	554	1,875	1909*.....	2,596	291	2,887
1899.....	1,951	514	2,475	1910*.....	4,441	314	4,755
1900.....	2,648	505	3,153	1911*.....	3,143	387	3,530
1901.....	.....	.....	3,384	1912*.....	4,403	512	4,915
1902.....	.....	.....	4,070	1913*.....	4,561	771	5,332
1903.....	.....	.....	5,152	1914*.....	1,962	273	2,235
1904.....	.....	.....	3,441	1915*.....	1,250	835	2,085
1905*.....	4,896	595	5,491	1916*.....	2,708	1,367	4,075
1906*.....	6,232	720	6,952	1917*.....	2,585	2,861	5,446
				1918*.....	3,668	2,807	6,475

* Includes Canadian output.

† Includes Canadian output and equipment built in railroad shops.

domestic service and 2,861 for export. In spite of the high rate of production which was attained at various times during the year the total was not as great as in the peak years of 1906 and 1907, when 6,952 and 7,362 locomotives were produced respectively.

A Statement of Mr. Baruch's

In Mr. Creel's Official Bulletin of November 2 there appeared a statement (reproduced in the *Railway Age* of November 8), authorized by B. M. Baruch, chairman of the War Industries Board, to the effect that the standard gage steam locomotive industry of the United States, operating under the direction of the War Industries Board, had increased its rate of production approximately 100 per cent in the preceding three months. During the last week of October the output of the three standard gage companies was 144 locomotives. From 1910 to August, 1918, the statement said, the largest number ever turned out in a single year was 3,776, which would represent an average weekly output of 72.6 loco-

motives. The statement, continuing, emphasized the fact that this increase in production was accomplished without expenditure to increase plant facilities or to enlarge the existing works, but was made possible by a redistribution of orders and concentration of the plants on particular types of locomotives.

The figures that are now available show, however, that Mr. Baruch's statement has not worked out as his publicity man had hoped. The production of steam locomotives was by no means doubled in 1918, and, in fact, the totals for this year, even inclusive of more than 600 little narrow gage gasoline locomotives, as well as other small equipment included in the *Railway Age's* reports, was but 1,000 larger than in 1917 and did not come within 4,000 of being double the figures for that year, nor within 2,000 of being double the domestic production alone in 1910, 1912 and 1913. A reference to Table IV in this article will bear out these last statements. With all due respect to the about to be deceased War Industries Board, it could not keep up with what Mr. Creel's Bureau could say about it.

The statement also continues to the effect that the "Pershing" locomotive, built on standard plans for the United States military railways is said to have been made the sole type of steam locomotive in use behind the American lines in France, and also to have been adopted by the British and French governments as the standard type for their armies

on the western front. It might be considered somewhat unkind to observe that the so-called "Pershing" locomotive was already in service on the British lines of communication even before we went into the war, or if one drew attention to the fact that there have been other designs of steam locomotives sent over for the American Expeditionary forces, and that American locomotive plants themselves have built engines to French designs for use behind the fronts. But enough has been said to show that, like much other Washington publicity, the statement of Mr. Baruch was far from the facts and should never have been published.

The Lists of Orders

The lists of orders appended are from official sources. They will, no doubt, suffer from a few omissions of small and less important orders, but will, nevertheless, show in a clear way the business that the locomotive plants have received during 1918. The *Railway Age* did not as usual send out letters to all the railroads this year, because it was able to obtain most of its data from the Railroad Administration, from the director general military railways, and from other government sources. The usual letters were sent to the builders, and the output figures were obtained directly from them. Lists from the builders, as well as the usual weekly reports, permitted the checking and amplification of the lists in the usual way.

Locomotive Orders in 1918

Ordered by the United States Railroad Administration

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick Arch	Valve Gear	Mechanical Stoker	Builder
United States Railroad Administration....	287	26 x 30	290,800	2-8-2	Yes	Yes	Walschaert	Duplex	American
	183	26 x 30	290,800	2-8-2	Yes	Yes	Walschaert	Duplex	Baldwin
	60	26 x 30	290,000	2-8-2	Yes	Yes	Walschaert	Duplex	Lima
	130	27 x 32	320,000	2-8-2	Yes	Yes	Walschaert	Standard	American
	87	27 x 32	320,000	2-8-2	Yes	Yes	Walschaert	Standard	Baldwin
	20	27 x 30	320,000	4-8-2	Yes	Yes	Baker	Standard	American
	15	27 x 30	320,000	4-8-2	Yes	Yes	Baker	Standard	Baldwin
	3	28 x 30	352,000	4-8-2	Yes	Yes	Baker	Standard	American
	2	28 x 30	352,000	4-8-2	Yes	Yes	Baker	Standard	Baldwin
	30	.....	.....	2-8-0	Yes	.....	.....	.....	Baldwin
	10	25 x 28	270,000	4-6-2	Yes	Yes	Baker	.....	American
	33	25 x 28	270,000	4-6-2	Yes	Yes	Baker	.....	Baldwin
	10	27 x 28	300,000	4-6-2	Yes	Yes	Baker	Duplex	American
	10	27 x 28	300,000	4-6-2	Yes	Yes	Baker	Duplex	Baldwin
	75	27 x 32	352,000	2-10-2	Yes	Yes	Southern	Duplex	American
	49	27 x 32	352,000	2-10-2	Yes	Yes	Southern	Duplex	Baldwin
	40	30 x 32	390,000	2-10-2	Yes	Yes	Southern	Hanna	American
	10	30 x 32	390,000	2-10-2	Yes	Yes	Southern	Hanna	Baldwin
	130	31 x 28	165,000	0-6-0	Yes	Yes	Baker	.....	American
	20	21 x 28	165,000	0-6-0	Yes	Yes	Baker	.....	Baldwin
	75	25 x 28	214,000	0-8-0	Yes	Yes	Baker	.....	American
	75	25 x 28	214,000	0-8-0	Yes	Yes	Baker	.....	Baldwin
	15	23 & 35 x 32	440,000	2-6-6-2	Yes	Yes	Baker	Standard	American
	15	23 & 35 x 32	440,000	2-6-6-2	Yes	Yes	Baker	Standard	Baldwin
	5	25 & 39 x 32	540,000	2-8-8-2	Yes	Yes	Baker	Duplex	American
	41	25 & 39 x 32	540,000	2-8-8-2	Yes	Yes	Baker	Duplex	Baldwin
	70	.....	.....	Lt. 2-8-2	.....	.....	.....	Duplex	Lima
	30	.....	.....	Unassigned	.....	.....	.....	.....	Lima
	25	.....	.....	Lt. 2-8-2	.....	.....	.....	Duplex	American
	73	.....	.....	Hvy. 2-8-2	.....	.....	.....	Standard	American
	95	.....	.....	Hvy. 2-10-2	.....	.....	.....	Duplex	American
	16	.....	.....	Lt. 4-6-2	.....	.....	.....	.....	American
	10	.....	.....	Hvy. 4-8-2	.....	.....	.....	Standard	American
	105	.....	.....	0-6-0	.....	.....	.....	.....	American
	25	.....	.....	0-8-0	.....	.....	.....	.....	American
	60	.....	.....	2-8-8-2	.....	.....	.....	Duplex	American
	91	.....	.....	Unassigned	.....	.....	.....	.....	American

Director General Military Railways

FRENCH STANDARD GAGE									
Director General Military Railways.....	510	21 x 28	166,400	2-8-0	Yes	No	Walschaert	.....	Baldwin
	500	21 x 28	166,400	2-8-0	Yes	No	Walschaert	.....	Baldwin
	100	25 x 28	202,500	2-10-0	Yes	No	Walschaert	.....	Baldwin
	100	25 x 28	200,000	2-10-0	Yes	No	Walschaert	.....	American

*FRENCH STANDARD GAGE LOCO. TENDERS

5	.....	100,000	2-8-0	.....	.....	.....	.....	.....	American
15	.....	112,000	2-8-0	.....	.....	.....	.....	.....	Baldwin

60 C/M GAGE LOCOMOTIVES

104	4 & 5 1/2 x 7	15,000	50 hp. gasol'e	.....	.....	G'r s. rod driv.	.....	G. D. Whitcomb Co.
60	2 & 9 x 12	34,500	Steam	No	No	Walschaert	.....	Davenport
30	2 & 9 x 12	34,500	Steam	No	No	Walschaert	.....	Vulcan

*Not included in totals.

Other Orders from Railways

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve Gear	Mechanical Stoker	Builder
Bingham & Garfield.....	1	26 & 41 x 28	473,000	0-8-8-0	Yes	No	.....	.....	American
Cambria & Indiana.....	2	22 x 28	240,000	2-8-2	Yes	Yes	.....	.....	Baldwin
Canton R. R.....	1	18 x 24	105,000	0-6-0	No	Yes	.....	.....	Baldwin
Central of Georgia.....	3	21 x 28	162,000	0-6-0	No	Yes	.....	.....	Baldwin
Central Vermont.....	10	27 x 28	318,000	4-8-2	Yes	Yes	.....	.....	American
Chesapeake & Ohio.....	5	25 & 38 x 32	440,000	Mallet	Yes	Yes	.....	Duplex	American
Columbia & Nehalem River.....	10	27 x 30	276,000	2-8-2	Yes	Yes	.....	.....	American
Delaware & Hudson.....	15	22 & 35 x 32	437,000	2-6-6-2	Yes	Yes	.....	Duplex	American
Delaware, Lackawanna & Western.....	10	27 x 28	295,000	0-10-0	Yes	Yes	.....	.....	American
Fairport, Painesville & Eastern.....	1	17 x 24	120,650	2-6-2	No	No	.....	.....	Baldwin
Hocking Valley.....	20	27 x 30	295,000	2-8-0	Yes	Yes	.....	.....	American
Illinois Central.....	4*	28 x 30	321,000	2-8-2	Yes	Yes	.....	.....	American
Long Island.....	25	22 x 26	156,000	0-6-0	Yes	Yes	.....	.....	Baldwin
Maine Central.....	4	22 & 35 x 32	437,000	2-6-6-2	Yes	Yes	.....	Duplex	American
Missouri, Kansas & Texas.....	20	29 x 32	367,000	2-10-2	Yes	Yes	.....	.....	American
*Norfolk & Western.....	1	21 x 26	169,000	0-6-0	Yes	Yes	.....	.....	American
Northern Electric.....	42	23 x 28	203,000	0-8-0	Yes	Yes	.....	.....	American
Pennsylvania Railroad.....	150	22 x 28	202,000	4-6-0	Yes	Yes	.....	.....	American
Portland Terminal.....	115	21 x 28	166,000	0-6-0	Yes	Yes	.....	.....	American
Western Pacific.....	59	28 x 30	314,000	2-8-2	Yes	Yes	.....	.....	American
	1	22 & 35 x 32	427,000	2-6-6-2	Yes	Yes	Baker	(10 Duplex) Duplex	American
	1	.....	120,000	4-0-4	.....	.....	.....	Electric freight	Gen. Electric
	1	.....	.....	Switching	Yes	Yes	.....	.....	Juniata Shops
	1	.....	.....	2-10-0	Yes	Yes	.....	.....	Juniata Shops
	1	.....	.....	4-6-2	Yes	Yes	.....	.....	Juniata Shops
	1	.....	.....	2-8-2	Yes	Yes	.....	.....	Juniata Shops
	1	.....	.....	Mallet	Yes	Yes	.....	.....	Juniata Shops
	1	21 x 28	166,000	0-6-0	Yes	Yes	.....	.....	American
	1	28 x 30	330,000	2-8-2	Yes	No	.....	.....	American

*Orders reported by builders as of 1918, but not included in this year's totals because reported in last year's *Railway Age*.

From Private Car Lines and Industrials

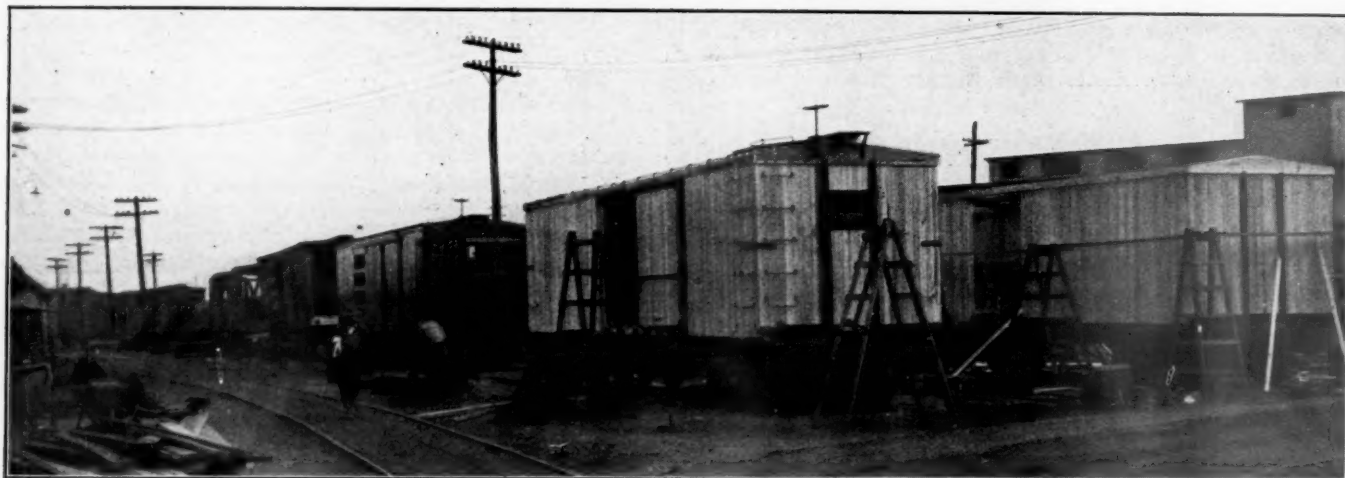
Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve Gear	Mechanical Stoker	Builder
Alan Wood Iron & Steel Co.....	1	22 x 26	160,000	0-6-0	.....	.....	.....	.....	Baldwin
American Bridge Company.....	1	18 x 24	100,000	0-6-0	No	Yes	.....	.....	Baldwin
Arlington Mills.....	1	.....	60,000	4-0-4	.....	.....	Electric	switch	Gen. Electric
Baldwin Locomotive Works.....	3	22 x 26	160,000	0-6-0	No	No	.....	.....	Baldwin
Baltimore Car & Foundry Co.....	4	22 x 26	160,000	0-6-0	No	No	.....	.....	Baldwin
Brier Hill Steel Company.....	1	22 x 26	160,000	0-6-0	No	No	.....	.....	Baldwin
Commonwealth Edison Co.....	1	.....	120,000	4-0-4	.....	.....	Electric	switch	Gen. Electric
Delaware River Steel Co.....	1	16 x 24	97,000	0-4-0	.....	.....	.....	.....	American
Forged Steel Wheel Co.....	1	22 x 26	160,000	0-6-0	No	No	.....	.....	Baldwin
Hudson Coal Co.....	1	11 x 16	42,000	0-4-0	.....	.....	.....	.....	American
Inland Steel Company.....	1	17 x 20	91,000	0-8-0	No	No	.....	.....	Baldwin
Lackawanna Steel Co.....	2	.....	.....	.....	.....	Yes	.....	.....	American
Miami Conservancy Dist.....	3	16 x 24	96,000	0-4-0	.....	.....	.....	.....	American
New York Shipbuilding Corp.....	10	14 x 22	76,000	0-4-0	.....	.....	.....	.....	American
Republic Iron & Steel Co.....	1	19 x 24	133,000	0-6-0	No	Yes	.....	.....	Baldwin
Struthers Furnace Co.....	1	22 x 26	175,000	2-6-0	No	Yes	.....	.....	Baldwin
Trumbull Steel Co.....	1	22 x 26	160,000	0-6-0	No	No	.....	.....	Baldwin
United States Metals Refining Co.....	2	8 x 12	20,500	0-4-0	No	No	.....	.....	Baldwin
Virginia Shipbuilding Corp.....	1	10 x 16	39,000	0-4-0	No	No	.....	.....	Baldwin

Canadian Government Railways

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve Gear	Mechanical Stoker	Builder
Canadian Government Rys.....	6	21 x 26	154,400	0-6-0	Yes	Yes	.....	.....	Canadian
	4	16½ x 22	100,100	Ng. 4-6-0	Yes	No	.....	.....	Canadian
	10	21 x 26	154,400	0-6-0	Yes	Yes	.....	.....	Canadian
	60	27 x 30	277,550	2-8-2	Yes	Yes	.....	.....	Canadian
	50	24 x 32	240,000	2-8-2	Yes	Yes	.....	.....	Montreal
	15	24 x 28	264,000	4-6-2	Yes	Yes	.....	.....	American
	20	21 x 26	160,000	0-6-0	Yes	Yes	.....	.....	American
	30	24 x 28	254,000	4-6-2	Yes	Yes	.....	.....	Montreal
Canadian Pacific.....	10	25 x 32	300,000	2-8-2	Yes	Yes	Walschaert	.....	Montreal shops
	4	24½ x 30	273,000	4-6-2	Yes	Yes	Walschaert	.....	Montreal shops

Orders from Other Countries

Purchaser	No.	Cylinders	Weight	Type	Super-heater	Brick arch	Valve Gear	Mechanical Stoker	Builder
Alto Cedro Sugar Co.....	1	.....	.....	2-6-0	.....	.....	.....	.....	American
Banes R. R. (Cuba).....	2	16 x 20	80,000	2-8-0	No	Yes	.....	.....	Baldwin
British War Mission.....	50	19 x 26	142,000	4-6-0	Yes	Yes	.....	.....	Baldwin
Central of Brazil.....	3	21½ x 26	165,000	2-8-0	Yes	Yes	.....	.....	American
	1	20 & 32 x 26	280,000	0-8-8-0	Yes	Yes	.....	.....	American
	2	21½ x 26	167,000	2-8-0	Yes	Yes	.....	.....	American
	3	16 & 25 x 20	157,000	2-6-6-2	Yes	No	.....	.....	Baldwin
Central Cunagua (Cuba).....	1	18 x 22	119,000	2-8-0	Yes	No	.....	.....	Baldwin
Central Resulta (Cuba).....	2	18 x 24	121,600	4-6-0	Yes	No	.....	.....	Baldwin
Chaparra Sugar Co (Cuba).....	1	13 x 12	28,300	0-4-0	.....	Fireless	.....	.....	Baldwin
Chilean State Rys.....	1	15 x 20	74,000	2-6-0	No	No	.....	.....	Baldwin
	20	22 x 28	195,000	2-8-2	Yes	Yes	.....	.....	American
	1	17 x 18 & 19 x 20	167,000	Comb. Rack & Adhesion	Yes	No	.....	.....	Baldwin
Cienfuegos, Palmira & Cruces.....	4	.....	120,000	404	Electric	freight	.....	.....	Gen. Electric
Constitutionalist Rys. of Mexico.....	8	.....	.....	2-8-2	.....	.....	.....	.....	Lima
F. C. Norte del Cuba.....	5	19 x 26	137,000	4-6-0	Yes	No	.....	.....	Baldwin
Frazar & Co. (Japan).....	2	6 x 12	12,800	0-4-0	No	No	.....	.....	Baldwin
Ingenio San Luis (Santo Domingo).....	1	11 x 16	43,000	2-6-0	Yes	No	.....	.....	Baldwin
Insp. Fed. des Estrades (Brazil).....	3	16 x 20	81,000	2-8-0	No	No	.....	.....	American
	2	16 x 20	80,000	4-6-0	No	No	.....	.....	American
Italian State Rys.....	150	21½ x 27½	147,000	2-8-0	Yes	No	.....	.....	American
Lunghai-Pienlo Ry. (China).....	4	21 x 28	181,350	2-8-2	Yes	Yes	.....	.....	Baldwin
Manati Sugar Co. (Cuba).....	1	13 x 18	50,000	0-6-0	No	No	.....	.....	Baldwin
Nippon Seikoshu (Japan).....	1	13 x 18	58,000	0-4-0	No	No	.....	.....	American
Paris-Lyons-Med. (France).....	100	.....	.....	2-8-2	.....	.....	.....	.....	Baldwin
Pekin-Kalgan (China).....	5	20 x 28	186,000	2-8-2	Yes	Yes	.....	.....	American
	3	20 & 32 x 26	290,000	Mallet	Yes	Yes	.....	.....	American
Peking-Mukden Ry. (China).....	10	21 x 28	188,000	2-8-2	Yes	Yes	.....	.....	Baldwin
Porcella, Vicini & Co. (Santo Domingo).....	1	8 x 14	27,000	2-6-0	No	No	.....	.....	Baldwin
Rhodesian Rys.....	9	22 x 24	172,000	4-8-2	Yes	Yes	.....	.....	American
Shantung Ry. (China).....	5	21 x 26	160,000	2-8-0	Yes	Yes	.....	.....	American
	2	20½ x 26	160,000	2-8-0	Yes	Yes	.....	.....	American
South African Rys.....	20	22 x 26	195,000	4-8-2	Yes	No	.....	.....	American
South Manchurian Ry.....	25	23 x 28	230,000	2-8-2	Yes	Yes	.....	.....	American
	5	.....	112,000	404	Electric	freight	.....	.....	Gen. Electric
Tientsin Pukow (China).....	10	20 x 28	195,000	2-8-2	Yes	Yes	.....	.....	American
United Rys. of Havana.....	6	20 x 26	159,000	2-8-0	Yes	Yes	.....	.....	American
	2	20 x 26	177,000	4-6-2	Yes	Yes	.....	.....	American
Usina Malemba (Brazil).....	1	10 x 16	36,000	0-4-2	No	No	.....	.....	Baldwin



Freight Car Orders in 1918 Exceed 1917 Figures

The Amount of Business Now on Hand Insures a Big Year
in 1919 from Production Standpoint

BECAUSE OF THE 100,000 standard freight cars ordered by the United States Railroad Administration in 1918, of which, however, only about 12 per cent have been delivered to date, the orders for freight cars in 1918 for domestic service in the United States and Canada were considerably in excess of those of 1917. They were not, however, as great as those of 1916, were only half those of

orders in 1918, contains a resumé of the locomotive business of the United States during the year just past. Even with the chance of covering similar ground in this article, it is worth while to sketch briefly what has occurred in the freight car market during 1918.

As in the case of locomotives, the predominating feature during the past year, insofar as the orders for freight cars were concerned, was the great proportion the government purchases held to the total orders. Unlike 1917, there were few orders from governments of other countries. The government orders referred to were those placed by our own authorities, either the United States Railroad Administration or the Director General Military Railroads.

The year opened very auspiciously with prospects for

Table I—The Freight Car Orders in 1918

Domestic—	
United States Administration.....	100,000
United States Army or Navy.....	740
Other railroad orders.....	1,227
Private car lines and industrials.....	12,146
Total United States.....	114,113
Canadian railroads.....	9,657
Total domestic.....	123,770
Foreign—	
Director General Military Railroads.....	36,875
Other foreign.....	16,672
Total foreign.....	53,547
Total of all orders.....	177,317

1912, and did not compare at all with those of the big years 1905 and 1906.

The orders for freight cars in 1918 totaled 177,317, of which 123,770 were on domestic orders and 53,547 were on foreign orders, principally for the United States Military Railroads in France. The orders in 1917 totaled 131,558 (excluding the 30,500 Russian cars which were cancelled), of which 79,367 cars were for domestic service and 34,167 were for export, principally for France and the Military Railroads.

The passenger car orders this year were practically nonexistent, war-time activities and presumably the omnipresent government desire for standardization not permitting the placing of such orders. The orders for passenger cars listed

Table II—The Passenger Car Orders of 1918

Domestic, United States and Canada.....	131
Foreign.....	26
Total.....	157

total only 157, including 131 for domestic service and 26 for export, as compared with 1,167 in 1917, of which 1,124 were for domestic service, 6 for the United States Government and 37 for export.

The article preceding this one, treating of the locomotive

Table III—Domestic Orders for Cars Since 1901

	Freight cars	Passenger cars		Freight cars	Passenger cars
1901.....	193,439	2,879	1910.....	141,024	3,881
1902.....	195,248	3,459	1911.....	133,117	2,623
1903.....	108,936	2,310	1912.....	234,758	3,642
1904.....	136,561	2,213	1913.....	146,732	3,179
1905.....	341,315	3,289	1914.....	80,264	2,002
1906.....	310,315	3,402	1915.....	109,792	3,101
1907.....	151,711	1,791	1916.....	170,054	2,544
1908.....	62,669	1,319	1917.....	79,367	1,167
1909.....	189,360	4,514	1918.....	123,770	131

heavy orders from the railroads, which were soon dispelled with the announcement that purchases for our own railroads would be centralized and placed by the Railroad Administration. It was not until April, however, that orders for 100,000 standard cars were placed, divided as follows:

25,000 40-ton double sheathed box.
25,000 50-ton single sheathed box.
20,000 50-ton composite gondola.
5,000 70-ton low side gondola.
25,000 55-ton hopper.
100,000

Quantity production on these orders was promised by the Railroad Administration for August, but was not reached until November, and up to December 21, the latest date for which figures are available at this writing, only 11,815 have been delivered.

The orders placed by the Director General Military Railroads totaled 36,875. The first orders this year were in February and totaled about 5,000. In July an order for 10,000 additional was divided among several builders, and

was shortly afterward supplemented by 20,000 more. In September an additional 40,000 cars were ordered, but immediately following the signing of the armistice this last 40,000 was cancelled before production had been begun on them. One of the tables, giving a resumé of the orders on hand at the various car building plants of the country as

the production of other cars, and it cannot be said that the car building plants have been particularly rushed at any time.

The resumé of freight car orders on hand on November 1 shows a total of 235,614 cars, of which only 20,400 had been delivered, leaving a total of 215,214 still to be delivered, divided about evenly between foreign and domestic orders. This total represents nearly double as many cars as have on the average been produced annually for the past five years inclusive of 1918. Even with the elimination of such orders

Table IV. Freight and Passenger Cars Built

	1918			1918		
	Domestic	Foreign	Total	Freight	Passenger	Total
Domestic	81,767		81,767	81,767	1,481	83,248
Foreign		42,941	42,941	42,941	92	43,033
			124,708	124,708	1,573	126,281

Year	Comparison with Previous Years					
	Domestic	Foreign	Total	Domestic	Foreign	Total
1899	117,982	1,904	119,886	1,201	104	1,305
1900	113,070	2,561	115,631	1,515	121	1,636
1901	132,591	4,359	136,950	1,949	106	2,055
1902	161,747	2,800	164,547	1,948		1,948
1903	153,195	1,613	154,808	2,007		2,007
1904	60,955	1,995	62,950	2,144		2,144
1905	162,701	5,305	168,006	2,551		2,551
1906	236,451	7,219	243,670	3,167		3,167
1907	280,216	9,429	289,645	5,457		5,457
1908	75,344	1,211	76,555	1,645	71	1,716
1909	91,077	2,493	93,570	2,698	151	2,849
1910	176,374	4,571	180,945	4,136	276	4,412
1911	68,961	3,200	72,161	3,938	308	4,246
1912	148,357	4,072	152,429	2,822	238	3,060
1913	198,066	9,618	207,684	3,076	220	3,296
1914			104,541			3,691
1915	59,984	14,128	74,112	1,935	14	1,949
1916	113,692	21,309	135,001	1,769	70	1,839
1917	119,363	32,038	151,401	1,969	31	2,000
1918	81,767	42,941	124,708	1,481	92	1,573

* Includes Canadian output.

† Includes Canadian output and equipment built in company shops.

of November 1, contains a column showing the status of the military orders on that date—that is, before any cancellations had taken place. From that column it will be seen that there were then outstanding orders for 85,834 cars. There had been shipped on these orders 2,575 cars, leaving 83,259 to be delivered. These figures are also to be shown as follows:

TOTAL OF ALL CARS ORDERED BY THE UNITED STATES MILITARY RAILROADS FROM THE TIME THE UNITED STATES ENTERED THE WAR TO NOVEMBER 1, 1918.

	Ordered	Shipped	Remaining to be shipped
Standard gage cars	98,069	19,395	78,674
Narrow Gage cars	8,579	3,994	4,585
Total of all military cars ordered	106,648	23,389	83,259

Figures for standard gage cars include 6,000 sets box car metalics ordered by military railroads and 36 shuttle cars and 73 mortar cars ordered by the ordnance department.

These military cars have been an important factor in the year's business, but they have not been sufficient to impede

Standard Car Deliveries to December 21.

Atlantic Coast Line	50	50-ton Gondola	Am. Car & Fdy.
Bessemer & Lake Erie	250	50-ton Gondola	Pressed Steel
Buffalo, Rochester & Pittsburgh	250	55-ton Hopper	Am. Car & Fdy.
Carolina, Clinchfield & Ohio	250	55-ton Hopper	Standard Steel
Chicago & North Western	1,250	55-ton Hopper	Pressed Steel
Chicago, Burlington & Quincy	422	40-ton Box	Am. Car & Fdy.
Charleston & Western Carolina	10	40-ton Box	Am. Car & Fdy.
Cleve., Cin., Chicago & St. Louis	81	40-ton Box	Am. Car & Fdy.
Georgia	200	55-ton Hopper	Am. Car & Fdy.
Kanawha & Michigan	200	55-ton Hopper	Pressed Steel
Michigan Central	86	50-ton Gondola	Am. Car & Fdy.
Missouri Pacific	16	40-ton Box	Am. Car & Fdy.
New York Central	500	40-ton Box	Am. Car & Fdy.
New York, New Haven & Hart.	357	55-ton Hopper	Standard Steel
Toledo & Ohio Central	400	55-ton Hopper	Standard Steel
Total	2,279	40-ton Box	
	3,009	50-ton Gondola	
	6,300	55-ton Hopper	
	227	50-ton Box	
	11,815	to December 21	

for the United States Military Railroads as have been cancelled since November 1, the indications for a big year from the production standpoint in 1919 are very favorable.

The largest single order remaining is, of course, that of 100,000 cars for the United States Railroad Administration. As of November 1, only 2,742 of these cars had been delivered.

A Resumé of the Freight Car Orders on Hand on November 1.

	Total on order November 1	U. S. military roads	Allied and neutral	Private lines and corporations	Army and navy	Railroad Administration	Total foreign	Total domestic
American Car & Foundry Co.	66,465	17,684	14,236	2,928	617	31,000	31,920	34,545
Bettendorf Co.	4,034	1,000			34	3,000	1,000	3,034
Cambria Steel Co.	7,036	1,120		2,916		3,000	1,120	5,916
Chicago Steel Car Co.	256			256				256
General American Tank Car Co.	4,386	1,425		2,706	255		1,425	2,961
Haskell & Barker Car Co.	18,450	10,450				8,000	10,450	8,000
Keith Car & Manufacturing Co.	6,000	1,150	3,000	350		1,500	4,150	1,850
Keith Railway Equipment Co.	500	500					500	
Kilbourne & Jacobs Manufacturing Co.	280	280					280	
Koppel Industrial Car Co.	800	800					800	
Laconia Car Co.	1,150			150		1,000		1,150
Lakewood Engineering Co.	387	387					387	
Lenoir Car Co.	3,000			1,000		2,000		3,000
Liberty Car & Equipment Co.	3,150	2,150				1,000	2,150	1,000
McGuire-Cummings Manufacturing Co.	500					500		500
Magor Car Co.	2,808	749	1,035	20	4	1,000	1,784	1,024
Mt. Vernon Car Manufacturing Co.	7,209	1,200	500	1,509		4,000	1,700	5,509
Pacific Car & Foundry Co.	2,390			388	2	2,000		2,390
Pacific Tank Car Co.	949	660		289			660	289
Pressed Steel Car Co.	25,860	10,875	220	761	4	14,000	11,095	14,765
Pullman Co.	19,909	7,709	3,200	1,000		8,000	10,909	9,000
Ralston Steel Car Co.	5,400	1,400				4,000	1,400	4,000
St. Louis Car Co.	2,750	1,750				1,000	1,750	1,000
Standard Car Const. Co.	2,923	2,100		823			2,100	823
Standard Steel Car Co.	48,094	21,745	9,134	2,125		15,000	30,879	17,215
Western Wheeled Scraper Co.	928	700		228			700	228
Total cars on order November 1	235,614	85,834	31,325	17,539	916	100,000	117,159	118,455
On November 1 there had been shipped on these orders	20,400	2,575	6,368	8,463	252	2,742	8,943	11,457
Leaving to be shipped	215,214	83,259	24,957	9,076	664	97,258	108,216	106,998

ered, a figure which had been brought up on December 21 to 11,815. The table headed Standard Car Deliveries to December 21, 1918, will show to what railroads these cars have gone.

Freight Car Production in 1918

The number of freight cars built in 1918, as shown in one of the tables, totaled 124,708, of which 81,767 were on domestic orders and 42,941 for the United States Military Railroads, or for other foreign service. The total production for 1918 was less than in 1917, when 151,401 cars were produced, of which 119,363 were for domestic and 32,038 were for foreign service. It is not necessary to discuss the domestic total in detail here, because that is taken up in an article elsewhere in this issue entitled the "Motive Power and Rolling Stock Situation." It is necessary to observe,

however, that whereas the total production of cars for domestic service makes 1918 one of the low years in the period from 1899 to date, the production of cars for foreign service is by far the largest yet reported. These cars that we are building for overseas service, like the locomotives, represent one of America's achievements in the war. It is the hope of every American supply man that we can continue to keep up that total now that the war is over, and thereby secure the fair share of foreign trade in freight cars that is due America's plants in that industry.

The production of passenger cars in 1918 was very low, the total of 1,573 being the lowest since 1901.

The lists of orders which follow are compiled from official sources. A reference to the way in which the data is obtained will be found at the end of the preceding article on locomotive orders in 1918.

Ordered by the United States Railroad Administration

Purchaser	No.	Class	Capacity	Construction	Weight	Draft Gear	Builder	Plant
United States Railroad Administration....	1,000	D. s. box	80,000	St. und'frame	44,000	Westinghouse	Am. Car & Fdy.	Berwick, Pa.
	5,000	D. s. box	80,000	St. und'frame	44,000	.....	Am. Car & Fdy.	St. Louis, Mo.
	3,000	D. s. box	80,000	St. und'frame	44,000	Cardwell	Am. Car & Fdy.	Chicago
	2,000	D. s. box	80,000	St. und'frame	44,000	Sessions	Am. Car & Fdy.	Memphis, Tenn.
	2,000	D. s. box	80,000	St. und'frame	44,000	.....	Standard Steel	Hammond, Ind.
	4,000	D. s. box	80,000	St. und'frame	44,000	Sessions	Mt. Vernon	Mt. Vernon, Ill.
	1,000	D. s. box	80,000	St. und'frame	44,000	Sessions	Pac. Car & Fdy.	Seattle, Wash.
	1,000	D. s. box	80,000	St. und'frame	44,000	Sessions	Pac. Car & Fdy.	Portland, Ore.
	1,000	D. s. box	80,000	St. und'frame	44,000	Cardwell	Liberty Car Eq.	Hammond, Ind.
	1,500	D. s. box	80,000	St. und'frame	44,000	Westinghouse	Keith Car	Sagamore, Mass.
	1,000	D. s. box	80,000	St. und'frame	44,000	Westinghouse	Laconia	Laconia, N. H.
	2,000	D. s. box	80,000	St. und'frame	44,000	Sessions	Lenoir	Lenoir City, Tenn.
	500	D. s. box	80,000	St. und'frame	44,000	Westinghouse	McGuire-Cummings	Paris, Ill.
	5,500	S. s. box	100,000	Steel frame	44,000	Sessions	Am. Car & Fdy.	Madison, Ill.
	3,500	S. s. box	100,000	Steel frame	44,000	Westinghouse	Am. Car & Fdy.	Berwick, Pa.
	6,000	S. s. box	100,000	Steel frame	44,000	.....	Pullman	Pullman, Ill.
	6,000	S. s. box	100,000	Steel frame	44,000	Cardwell	Haskell & Barker	Michigan City, Ind.
	1,000	S. s. box	100,000	Steel frame	44,000	Sessions	St. Louis	St. Louis, Mo.
	3,000	S. s. box	100,000	Steel frame	44,000	Cardwell	Bettendorf	Bettendorf, Ia.
	3,000	Gondola	100,000	Composite	44,000	.....	Am. Car & Fdy.	St. Louis, Mo.
	1,000	Gondola	100,000	Composite	44,000	Sessions	Am. Car & Fdy.	St. Charles, Mo.
	6,500	Gondola	100,000	Composite	44,000	Sessions	Am. Car & Fdy.	Terre Haute, Ind.
	5,500	Gondola	100,000	Composite	44,000	Cardwell	Murray Pr. Steel	Hegewisch, Ill.
	2,000	Gondola	100,000	Composite	44,000	.....	Stand. Steel	Hammond, Ind.
	1,000	Gondola	100,000	Composite	44,000	Cardwell	Haskell & Barker	Michigan City, Ind.
	3,500	Hopper	110,000	Steel	40,840	Sessions	Magor Car	Passaic, N. J.
	2,500	Hopper	110,000	Steel	40,840	Westinghouse	Am. Car & Fdy.	Berwick, Pa.
	5,000	Hopper	110,000	Steel	40,840	Sessions	Am. Car & Fdy.	Huntington, W. Va.
	5,000	Hopper	110,000	Steel	40,840	Sessions	Pressed Steel	McKees Rocks, Pa.
	3,000	Hopper	110,000	Steel	40,840	Sessions	Stand. Steel	Butler, Pa.
	2,000	Hopper	110,000	Steel	40,840	Westinghouse	Cambria	Johnstown, Pa.
	4,000	Hopper	110,000	Steel	40,840	.....	Pullman	Pullman, Ill.
	2,500	L. s. gondola	140,000	Steel	49,500	Sessions	Ralston	Columbus, Ohio.
	2,500	L. s. gondola	140,000	Steel	49,500	Sessions	Pressed Steel	Allegheny, Pa.
						Sessions	Stand. Steel	Butler, Pa.

United States Military Railroads

FRENCH STANDARD GAUGE									
Purchaser	No.	Class	Capacity	Construction	Weight	Draft Gear	Trucks	Roofs	Builder
United States Military Railways.....	650	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	Liberty
	350	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	St. Louis
	2,609	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	Am. Car & Fdy.
	250	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	Mt. Vernon
	1,500	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	Pressed Steel
	210	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	Standard Steel
	2,000	Box	66,000	Composite	34,000	French Standard	Arch Bar	Canvas Cov'd	Pullman
	400	Tank	66,000	Steel	35,300	French Standard	Arch Bar	None	Standard Car Cons.
	400	Tank	66,000	Steel	35,300	French Standard	Arch Bar	None	Gen. American
	1,500	Flat	66,000	Composite	26,500	French Standard	Arch Bar	None	Haskell & Barker
	1,000	Flat	66,000	Composite	26,500	French Standard	Arch Bar	None	Standard Steel
	6	Flat	200,000	Composite	.....	French Standard	Arch Bar	None	Standard Steel
	700	Flat	66,000	Composite	26,500	French Standard	Arch Bar	None	Pullman
	300	Flat	66,000	Composite	26,500	French Standard	Arch Bar	None	Standard Car Cons.
	750	Refrigerator	66,000	Composite	47,200	French Standard	Arch Bar	Canvas Cov'd	Haskell & Barker
	500	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Cambria
	1,500	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Haskell & Barker
	1,929	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Amer. Car & Fdy.
	1,000	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Pressed Steel
	400	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Standard Steel
	700	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Liberty
	600	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	St. Louis
	500	L. S. Gonds.	66,000	Composite	28,900	French Standard	Arch Bar	None	Gen. American
	6,750	H. S. Gonds.	66,000	Composite	32,800	French Standard	Arch Bar	None	Standard Steel
	4,400	H. S. Gonds.	66,000	Composite	32,800	French Standard	Arch Bar	None	Amer. Car & Fdy.
	1,500	H. S. Gonds.	66,000	Composite	32,800	French Standard	Arch Bar	None	Haskell & Barker
	2,300	H. S. Gonds.	66,000	Composite	32,800	French Standard	Arch Bar	None	Pressed Steel
	500	H. S. Gonds.	66,000	Composite	32,800	French Standard	Arch Bar	None	Pullman
	557	Ballast	66,000	Composite	32,600	French Standard	Arch Bar	None	Amer. Car & Fdy.
	100	Dump	12 yd.	Composite	31,300	French Standard	Arch Bar	None	West. Wh. Sc.
	100	Dump	12 yd.	Composite	33,000	M. C. B.	Arch Bar	None	West. Wh. Sc.
	100	Dump	16 yd.	Composite	38,000	M. C. B.	Arch Bar	None	West. Wh. Sc.
	250	Dump	20 yd.	Composite	52,000	French Standard	Arch Bar	None	West. Wh. Sc.
	*4	Motor	.....	.....	.....	None	None	None	Fair., Morse
	*112	Push	.....	Wood	.....	None	None	None	Buda Co.
60 C/M GAUGE									
	100	L. S. Gonds	22,000	Composite	9,500	Special	Arch Bar	None	Magor
	64	V-Dump	1½ yd.	Steel	1,800	Special	None	None	Kilbourne & Jacobs
	100	Side Dump	1½ yd.	Steel	1,800	Special	None	None	West. Wh. Sc.
36-INCH GAUGE									
	400	Logging	.....	Composite	18,000	¾ size M. C. B.	Arch Bar	None	Gregg

*Not included in totals.

Other Orders from Railways

	No.	Class	Capacity	Construction	Builder
Atchison, Topeka & Santa Fe	50	Ore	100,000	St. un.	Am. Car & Fdy.
Alaquippa & Southern Ry.	25	Hop.	110,000	Steel	Pressed Steel
Birmingham Southern Ry.	20	Flat	140,000	Steel	Pressed Steel
*Chicago & North Western	50	Cab. un.			Bettendorf
Chicago, Milwaukee & St. Paul	1,000				Co. shops
*Chicago, St. Paul, Minneapolis & Omaha	10	Cab. un.			Bettendorf
Colorado & Wyoming	100	G. S. bod.	100,000	Steel	Pressed Steel
*Illinois Central	50	Cab. un.			Bettendorf
Monongahela Conn., R. R.	25	Hop. bod	110,000	Steel	Pressed Steel
Monongahela Valley Tract. Co.	4	Ballast	60,000	Steel	Am. Car & Fdy.
Norfolk & Western	2	Tank	8,050g	Steel	Pa. Tank Car
*Union Pacific	1	Dyn.			Burr Co.
	50	Cab. un.			Bettendorf

†Order totals 5,000, of which only 1,000 were on the 1918 program.

From Private Car Lines and Industrials

	No.	Class	Capacity	Construction	Builder
Air Nitrates Company	3	Gon.	100,000	Steel	Pressed Steel
Aetna Ref. Co.	50	Tank			Gen. American
Allegheny Steel Co.	5	Gon.	140,000	Steel	Pressed Steel
	4	Hop.	110,000	Steel	Pressed Steel
Aluminum Co. of Am.	20	Hop.	140,000	Steel	Pressed Steel
American Ammonia Co.	1	Tank	8,050g	Steel	Pa. Tank Car
American Cyanide Co.	20	Hop.			Chic. St. Car
American Linseed Co.	20	Tank	10,050g	Steel	Pa. Tank Car
American Ry. Equip. Co.	6	Tank	8,050g	Steel	Pa. Tank Car
	21	Hop.	110,000	Steel	Pressed Steel
Am. Smelting Sec. Co.	4	Tank			Gen. American
Am. Sheet & Tin Plate Co.	20	Tank	10,050g	Steel	Pa. Tank Car
Am. Steel & Wire Co.	100	Gon.	100,000	Steel	Pressed Steel
	10	Tank	8,050g	Steel	Pa. Tank Car
American Car Co.	4	Tank	10,050g	Steel	Pa. Tank Car
Anaconda Copper Min. Co.	3	Hop.	120,000	Steel	Mt. Vernon
Armour Car Lines	75	Tank			Chic. St. Car
Aspromet Company	6	Tank	8,050g	Steel	Pa. Tank Car
Balfour Williamson & Co.	4	Tank	8,050g	Steel	Pa. Tank Car
Bethlehem Steel Co.	30	Quarry			Magor
Biery Oil Company	13	Tank	8,050g	Steel	Pa. Tank Car
Bigheart Ref. Co.	40	Tank	8,050g	Steel	Pa. Tank Car
	20	Tank	10,050g	Steel	Pa. Tank Car
Bleyler Tank Line	10	Tank	8,050g	Steel	Pa. Tank Car
Bodenheimer Molasses Co.	5	Tank			Chic. St. Car
Brier Hill Steel Co.	40	Hop.	140,000	Steel	Pressed Steel
	10	Gon.	140,000	Steel	Pressed Steel
	25	G. S.			Clark Car
Bunker Hill & Sullivan Mining & Con. Co.	6	Hop.	110,000	Steel	Pressed Steel
Butterworth, Judson Co.	75	Tank	7,250g	Steel	Cambria
Caddo Oil Refining Co.	15	Tank	8,050g	Steel	Pa. Tank Car
	15	Tank	8,050g	Steel	Pa. Tank Car
Calumet & Ariz. Mining Co.	3	Tank			Gen. American
Cambria Steel Co.	2	Tank	10,200g	Steel	Cambria
	2	Tank	10,200g	Steel	Cambria
	5	Hop.			Cambria
	47	1-bm. gon. bod.			Cambria
Canadian Equipment Co.	50	Auto. dp	16 yd		West. Wh. Sc.
Carnegie Steel Co.	12	Gon.			Chic. St. Car
	35	Tank	10,050g	Steel	Pa. Tank Car
Certain-teed Products Co.	5	Tank	8,050g	Steel	Pa. Tank Car
Champlin Refining Co.	10	Tank	8,050g	Steel	Pa. Tank Car
Clark Car Co.	500	Ext. side dump			Cambria
	250	Ext. side dump			Cambria
Clinton Iron & Steel Co.	6	Gon.	110,000	Steel	Pressed Steel
Columbia Naval Stores Co.	3	Tank	8,050g	Steel	Pa. Tank Car
	3	Tank	8,050g	Steel	Pa. Tank Car
Condon & Bolen	17	Hd. dp	12 yd		West. Wh. Sc.
Consumers Ref. Co.	75	Tank			Gen. American
Crucible Steel Co.	4	Tank	10,050g	Steel	Pa. Tank Car
	8	Hop.	110,000	Steel	Pressed Steel
	7	Gon.	100,000	Steel	Pressed Steel
Detroit Iron & Steel Co.	1	Flat			Pac. Car & Fdy.
Discovery Bay Logging Co.	200	Tank	8,050g	Steel	Pa. Tank Car
Doherty, Henry I., & Co.	10	Tank			Gen. American
Dunbar Moy, & Sugar Co.	1	Flat			Pa. Tank Car
Du Pont, E. I., de Nemours & Co.	1,864	Solv. Rec.		Wood	Am. Car & Fdy.
	205	Gun Cot.		Wood	Am. Car & Fdy.
DuPont, E. I., de Nemours & Co.	1,000	Solv. Rec.		Wood	Am. Car & Fdy.
DuPont Eng. Co., Agent	35	Flat	100,000	Wood	Am. Car & Fdy.
	16	Box		Wood	Am. Car & Fdy.
	44	Shell		Wood	Am. Car & Fdy.
	30	N. g. box	30,000	St. un.	Am. Car & Fdy.
	60	Flat		St. un.	Am. Car & Fdy.
	4	Box		St. un.	Am. Car & Fdy.
	1	Flat		St. un.	Am. Car & Fdy.
	20	Flat	30,000	St. un.	Am. Car & Fdy.
DuPont Eng. Co.	6	N. g. flat		Wood	Am. Car & Fdy.
	10	Shell		Wood	Am. Car & Fdy.
Eagle Gasoline Co.	10	Tank			Gen. American
Eastern Refining Co.	10	Tank	8,050g	Steel	Pa. Tank Car
Emlenton Refining Co.	5	Tank	8,050g	Steel	Pa. Tank Car
	5	Tank	8,050g	Steel	Pa. Tank Car
Ensign Oil Company	2	Tank	8,050g	Steel	Pa. Tank Car
Evans, Thwing Ref. Co.	50	Tank	80,000	Steel	Am. Car & Fdy.
Federal Oil & Supply Co.	1	Tank	8,050g	Steel	Pa. Tank Car
Foco Oil Company	10	Tank	8,050g	Steel	Pa. Tank Car
Follansbee Bros.	1	Hop.	110,000	Steel	Pressed Steel
Foundation Co.	25	N. g. box		Wood	Am. Car & Fdy.
	6	N. g. flat		Wood	Am. Car & Fdy.
	24	Box		Wood	Am. Car & Fdy.
	4	Flat		Wood	Am. Car & Fdy.
	25	N. g. box		Wood	Am. Car & Fdy.
	6	N. g. flat		Wood	Am. Car & Fdy.
	22	Box		Wood	Am. Car & Fdy.

*Orders marked with an asterisk are not included in the totals.

	No.	Class	Capacity	Construction	Builder
Franklin Baker Co.	5	Flat		Wood	Am. Car & Fdy.
Galena Signal Oil Co.	2	Tank	8,050	Steel	Pa. Tank Car
Gen. Am. Tank Line	555	Tank			Gen. American
General Electric Co.	3	Gon.	100,000	Steel	Pressed Steel
General Equip. Co.	15	Tank	10,000g	Steel	Pressed Steel
Gen. Petroleum Corp.	30	Tank	10,050g	Steel	Pa. Tank Car
Golden Rule Ref. Co.	10	Tank	8,050g		Std. Car Cons.
Great American Ref. Co.	50	Tank			Gen. American
Great Northern Ref. Co.	10	Tank			Gen. American
Gulf Refining Co.	50	Tank	8,050g		Std. Car Cons.
Gulf Sulphur Co.	40	Tank	10,000g	Steel	Standard Steel
Hammond Lbr. Co.	2	Ballast			Pac. Car & Fdy.
Hannagan & Hanlon	10	Tank			Gen. American
Hanna M. A., Company	7	Gon.	100,000	Steel	Pressed Steel
	2	Hop.	100,00	Steel	Pressed Steel
Heaslip Mol. & Sugar Co.	10	Tank			Chic. St. Car
	10	Tank	8,050	Steel	Pa. Tank Car
	10	Tank	8,050	Steel	Pa. Tank Car
Hillman Oil & Gas Co.	20	Tank	8,050g		Std. Car Cons.
Hoffman Oil & Ref. Co.	2	Tank	10,050		Std. Car Cons.
Home Petroleum Co.	25	Tank	8,050g	Steel	Pa. Tank Car
Humble Oil Co.	30	Tank	12,000g	Steel	Pressed Steel
Illinois Oil Company	10	Tank	8,050g	Steel	Pa. Tank Car
Illinois Zinc Co.	10	Hop.	100,000	Steel	Am. Car & Fdy.
Imperial Oil Co.	100	Tank			Gen. American
Imperial Oil Co.	2	Tank			Gen. American
Indiahoma Ref. Co.	35	Tank			Chic. St. Car
	20	Tank			Chic. St. Car
	200	Tank			Gen. American
Ingersoll-Rand Co.	2	Hop.	110,000	Steel	Pressed Steel
Inland Steel Co.	30	Gon.			Chic. St. Car
	16	Hop.			Chic. St. Car
Inter. Coal Products	1	Tank	10,050g	Steel	Pa. Tank Car
Inter-Ocean Ref. Co.	12	Tank	8,050g	Steel	Pa. Tank Car
	13	Tank	10,050g	Steel	Pa. Tank Car
Johnson Oil Ref. Co.	10	Tank			Chic. St. Car
Jones, Fred R.	30	H'd dump	12 yd		West. Wh. Sc.
Kanotex Refining Co.	50	Tank	80,000	Steel	Am. Car & Fdy.
LaBelle Iron Works	15	Hop.	110,000	Steel	Pressed Steel
	20	Gon.	140,000	Steel	Pressed Steel
	5	Tank	10,050g	Steel	Pa. Tank Car
Liberty Oil Co., Ltd.	10	Tank	10,050g	Steel	Pa. Tank Car
Liberty Oil Co.	10	Tank	8,050g	Steel	Pa. Tank Car
Liberty Ref. & Oil Prod.	50	Tank	8,050g		Std. Car Cons.
Lone Star Ref. Co.	13	Tank			Gen. American
	10	Tank	8,050g	Steel	Pa. Tank Car
	10	Tank	8,050g	Steel	Pa. Tank Car
Louisiana Oil Ref. Corp.	20	Tank	10,050g	Steel	Pa. Tank Car
	70	Tank	8,050g	Steel	Pa. Tank Car
Lyon Lumber Company	25	Log	60,000	St. un.	Bettendorf
Manhattan Oil Co.	20	Tank			Gen. American
Marland Ref. Co.	200	Tank			Gen. American
Metal & Thermit Corp.	4	Tank			Chic. St. Car
Mexican Petroleum Corp.	50	Tank	100,000	Steel	Am. Car & Fdy.
Midvale Steel & Ord. Co.	6	Gon.			Cambria
Milton Mfg. Co.	6	Tank	100,000	Steel	Am. Car & Fdy.
Minn. General Elec. Co.	1	Air dump	30 yd		West. Wh. Sc.
Musher & Co.	6	Tank	8,050g	Steel	Pa. Tank Car
Mutual Ref. & Prod. Co.	50	Tank			Gen. American
National Carbon Co.	5	Tank			Pa. Tank Car
National Tube Company	263	Gon.	140,000	Steel	Pressed Steel
	120	Hop.	140,000	Steel	Pressed Steel
	50	Coke	140,000	Steel	Pressed Steel
	27	Flat	140,000	Steel	Pressed Steel
	10	Sklp	200,000	Steel	Pressed Steel
New Jersey Zinc Co.	10	Gon.	140,000	Steel	Pressed Steel
N. Y. Shipbuilding Corp.	10	Flat	100,000	Steel	Am. Car & Fdy.
No. Am. Oil & Ref. Co.	100	Tank			Gen. American
North American Ref. Co.	50	Tank			Chic. St. Car
	50	Tank			Gen. American
Ohio Valley Refining Co.	50	Tank	8,050g	Steel	Pa. Tank Car
Okla Petroleum & Gas Co.	100	Tank			Gen. American
Okmulgee Prod. & Ref. Co.	50	Tank	8,050g		Std. Car Cons.
Oliver Iron Mining Co.	100	Dump			Magor
Oliver Mining Co.	70	Air dump	20 yd		West. Wh. Sc.
Ozark Ref. Co.	5	Tank	8,050g		Std. Car Cons.
	5	Tank	10,050g		Std. Car Cons.
Ozarks Co.	1	Box	100,000	St. un.	Am. Car & Fdy.
Pacific Coast Steel Co.	75	Charging			Pac. Car & Fdy.
Parandale Ref. Co.	25	Tank	8,050g		Std. Car Cons.
Paragon Refining Co.	20	Tank	12,000g		Pressed Steel
Pease, F. M.	100	Tank	10,200g	Steel	Cambria
	100	Tank	10,200g	Steel	Cambria
	300	Tank	10,200g	Steel	Cambria
Penn. Am. Ref. Co.	8	Tank	8,050g	Steel	Pa. Tank Car
Pennsylvania Tank Line	17	Tank	8,050g	Steel	Pa. Tank Car
	2	Tank	10,050g	Steel	Pa. Tank Car
	4	Tank	8,050g	Steel	Pa. Tank Car
	1	Tank	8,050g	Steel	Pa. Tank Car
	1	Tank	8,050g	Steel	Pa. Tank Car
Phelps, Dodge & Co.	50	Ore	100,000		Pressed Steel
Phoenix Cotton Oil Co.	5	Tank	8,050g	Steel	Pa. Tank Car
Pierce Oil Corp.	50	Tank			Gen. American
	100	Tank			Gen. American
Pine Pool Gasoline Co.	40	Tank			Gen. American
Price, F. V. B.	5	Tank	10,000g	Steel	Am. Car & Fdy.
Publisher Ward Distilling Co.	1	Tank	8,050g	Steel	Pa. Tank Car
Red River Refining Co.	10	Tank	10,050g	Steel	Pa. Tank Car
	15	Tank	10,050g	Steel	Pa. Tank Car
Remington Arms Co.	2	Hop.	110,000	Steel	Pressed Steel
Republic Iron & Steel Co.	50	Gon.	140,000	Steel	Pressed Steel
River Terminal Co.	20	Tank	8,050g	Steel	Pa. Tank Car
Semet-Solvay Co.	95	Coke	100,000	Steel	Pressed Steel
Shippers Car Line	200	Tank	8,050g		Std. Car Cons.
Sinclair Ref. Co.	500	Tank			Gen. American
Skinner & Eddy	150	Gon.			Magor
Sloan & Zook	35	Tank			Gen. American
Smith, Levi, Inc.	1	Tank	8,050g	Steel	Pa. Tank Car
	3	Tank	8,050g	Steel	Pa. Tank Car
Southern Oil Corp.	25	Tank	10,050g	Steel	Pa. Tank Car
Spanish Am. Iron Co.	100	Ore	140,000		Am. Car & Fdy.
Staley, A. E., Mfg. Co.	6	Tank	8,050g	Steel	Pa. Tank Car
Standard Car Equip. Co.	200	Tank	8,050g		Std. Car Cons.

Purchaser	No.	Class	Capacity	Con- struction	Builder
Standard Car Equip. Co.	100	Tank	10,050g	.....	Std. Car Cons.
	5	Tank	8,050g	.....	Std. Car Cons.
	11	Tank	10,050g	.....	Std. Car Cons.
Sterling Ref. Co.	10	Tank	.....	.....	Gen. American
Sugar Products Co.	10	Tank	8,050g	.....	Std. Car Cons.
Sunshine State Oil & Ref. Co.	20	Tank	8,050g	.....	Std. Car Cons.
	15	Tank	8,050g	.....	Std. Car Cons.
	15	Tank	10,050g	.....	Std. Car Cons.
*Swift & Co.	300	.....	.....	Beef un.	Bettendorf
*Swift & Co.	100	Tank	8,050g	.....	Pa. Tank Car
Tennessee Coal & Iron	15	Tank	10,050g	.....	Pa. Tank Car
	10	Tank	10,050g	.....	Std. Car Cons.
	75	Tank	.....	.....	Gen. American
Texas Co.	400	Gun cot.	.....	.....	Kil. & Jac.
Thompson-Starret Co.	10	Tank	8,050g	.....	Pa. Tank Car
Titusville Oil Works	20	Gon.	100,000	.....	Pressed Steel
Trumbull Steel Co.	1	Gon.	140,000	.....	Pressed Steel
Union Rolling Mill Co.	1	Hop.	110,000	.....	Pressed Steel
United Oil Mfg. Co.	1	Tank	8,050g	.....	Pa. Tank Car
United Gas Imp. Co.	3	Tank	10,050g	.....	Pa. Tank Car
U. S. Industrial Alcohol Co.	50	Tank	8,050g	.....	Steel
	50	Tank	8,050g	.....	Steel
United Verde Copper Co.	8	Auto.dmp	20yd	.....	West. Wh. Sc.
Vancouver Equip. Co.	2	Hop.	.....	.....	Pac. Car & Fdy.
	2	Flat	.....	.....	Pac. Car & Fdy.
Warren Oil Co.	100	Tank	.....	.....	Gen. American
	30	Tank	8,050g	.....	Pa. Tank Car
Western Paper Makers Co.	1	Tank	.....	.....	Chic. St. Car
Westinghouse Elec. & Mfg. Co.	10	Hop.	110,000	.....	Steel
West Penn. Steel Co.	2	Gon.	140,000	.....	Pressed Steel
	10	Hop.	110,000	.....	Pressed Steel
Wheatcroft, I. H.	50	Tank	.....	.....	Gen. American
Whitaker, Glessner Co.	4	Hop.	110,000	.....	Pressed Steel
	4	Gon.	100,000	.....	Pressed Steel
White Eagle Pet. Co.	3	Tank	80,000	.....	Am. Car & Fdy.
Wichita Valley Ref. Co.	5	Tank	10,050g	.....	Pa. Tank Car
	10	Tank	8,050g	.....	Std. Car Cons.
Wright Prod. & Ref. Co.	20	Tank	.....	.....	Gen. American
Youngstown Sheet & Tube Co.	10	Tank	10,050g	.....	Std. Car Cons.

Canadian Railways

Purchaser	No.	Class	Capacity	Con- struction	Builder
Canadian Gov't. Rys.	5,000	Box	80,000	St. fr.	Can. Car & Fdy.
	1,000	Box	80,000	St. fr.	National
	650	Gon.	100,000	Comp.	Eastern Car
	750	Flat	80,000	Comp.	Eastern Car
	250	Side dp.	80,000	Wood	Hart-Otis
	200	S.&d.dp.	80,000	Wood	Hart-Otis
	50	Tank	8,000g	Steel	Pressed Steel
	250	Refrig.	.....	.....	Can. Car & Fdy.
	15	Tank	8,050g	Steel	Pa. Tank Car
Canadian Pacific	1,300	Box	80,000	St. und'frame	Angus shops
	106	Refrig.	60,000	St. und'frame	Angus shops
	18	Vans	.....	Wood	Winnipeg shops
	2	Snplws.	.....	Wood	Winnipeg shops
	1	Snplw.	.....	Wood	Angus shops
	65	Ore	100,000	Steel	Angus shops

Other United States Government Orders

Purchaser	No.	Class	Capacity	Con- struction	Builder
U. S. Gov't.	1	Gasoline motor car, hydrogen generating unit	.....	Steel	McKeen
U. S. Gov't, Ord Dept.	75	Tank	.....	.....	Gen. American
	150	Tank	.....	.....	Gen. American
	150	Ammun.	60,000	St. un.	Am. Car & Fdy.
	10	Tank	60,000	Steel	Am. Car & Fdy.
	12	Gun car.	.....	Steel	Am. Car & Fdy.
	65	Gun car.	.....	Steel	Am. Car & Fdy.
	2	Flat	.....	.....	Pac. Car & Fdy.
	30	Shuttle	.....	.....	Pullman
	73	Mortar	.....	.....	Pullman
U. S. Navy	2	Box	60,000	.....	Am. Car & Fdy.
	2	Flat	80,000	.....	Am. Car & Fdy.
	30	Flat	100,000	.....	Am. Car & Fdy.
	2	Flat	.....	.....	Chic. St. Car
	6	Flat	.....	.....	Chic. St. Car
	18	Flat	.....	.....	Chic. St. Car
	4	Box	.....	.....	Magor
	4	Flat	100,000	Steel	Pressed Steel
	30	Air dump	16 yd.	.....	West. Wh. Sc.
	12	Air dump	12 yd.	.....	West. Wh. Sc.
	6	Flat	.....	.....	Chic. St. Car
	6	Flat	.....	.....	Chic. St. Car
	10	Air dump	16 yd.	.....	West. Wh. Sc.
	2	Box	60,000	St. un.	Bettendorf
	30	Flat	100,000	St. un.	Bettendorf
	2	Flat	80,000	St. un.	Bettendorf

Orders from Other Countries

Purchaser	No.	Class	Capacity	Con- struction	Builder
Altro Cedro Northern	20	Cane	60,000	St. un.	Am. Car & Fdy.
Arbel, Pierre (France)	50	Gon.	80,000	Comp.	Pressed Steel
Am. Metals Co. (Mexico)	15	Hop.	110,000	Steel	Pressed Steel
	15	Tank	12,000g	Steel	Pressed Steel
Baragus Sug. Co. (Cuba)	50	Cane	60,000	Steel	Pressed Steel
Brazil Rys. Co.	300	Box	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
Brazil Rys. Co.	200	Stock	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
British Government	2,050	Box	40,000	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	1,200	Box	40,000	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....

Purchaser	No.	Class	Capacity	Con- struction	Builder
Bush & Daniels	12	Box	44,000	St. un.	Am. Car & Fdy.
Caragol, Manuel	6	Cane	60,000	St. un.	Am. Car & Fdy.
Central Cespedes (Cuba)	20	Cane	.....	.....	Magor
Central Cunagua	110	Cane	60,000	St. un.	Am. Car & Fdy.
	1	Tank	60,000	Steel	Am. Car & Fdy.
Cent. Lutgarda (Cuba)	25	Cane	.....	.....	Magor
Cent. Macagua (Cuba)	15	Cane	.....	.....	Magor
Central Patria	1	Cane	60,000	St. un.	Am. Car & Fdy.
Cent. Portagulete (Cuba)	10	Cane	.....	.....	Magor
Central San Augustin (Cuba)	25	Cane	.....	.....	Magor
Chandler & Co.	2	Box	44,000	Wood	Am. Car & Fdy.
	6	Flat	44,000	Wood	Am. Car & Fdy.
Colombian Northern	6	Box	30,000	St. un.	Am. Car & Fdy.
Cuba Northern	50	Box	60,000	St. un.	Am. Car & Fdy.
	200	Box	60,000	St. un.	Am. Car & Fdy.
Cuba Northern	10	Tank	6,000g	Steel	Am. Car & Fdy.
	4	Tank	100,000	Steel	Am. Car & Fdy.
Cuban Am. Sugar Co.	80	Cane	.....	.....	Magor
Egyptian State Rys.	30	Tank	.....	.....	Gen. American
Frazar & Co.	300	Flat bod.	60,000	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	200	Box bod.	60,000	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	500	Sets trucks	60,000	.....	Am. Car & Fdy.
Guantanamo & Western	25	Box	80,000	St. un.	Am. Car & Fdy.
Guantanamo & Western	17	Cane	60,000	Steel	Am. Car & Fdy.
Haganaers, Lionel	100	Dump	.....	.....	Magor
Haytian Am. Sugar Co.	200	Cane	.....	.....	Magor
Italian State Railways	5,000	Gon.	40,000	.....	Am. Car & Fdy.
		(Cabs & brks)	.....	.....	.....
	5,000	Gon.	40,000	.....	Am. Car & Fdy.
		(Without cabs)	.....	.....	.....
Lindo, August A., (Jamaica)	50	Cane	.....	.....	Magor
Rhodesian Railways	150	Gon.	66,000	Steel	Pressed Steel
South Porto Rico Sugar Co.	60	Cane	60,000	St. un.	Am. Car & Fdy.
Stork & Co., Chas. F.	150	Box	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	15	Gon.	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	20	Flat	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	80	Flat	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	4	Gon.	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
	7	Gon.	.....	.....	Am. Car & Fdy.
		(Iron Work)	.....	.....	.....
United Fruit Co	175	Cane	.....	.....	Magor
United Rys. of Yucatan	400	N. g. box	60,000	St. un.	Mt. Vernon
	100	Box	60,000	.....	Mt. Vernon
Veritentes Sugar Co.	86	Cane	60,000	Steel	Am. Car & Fdy.
West India Managt' Consult. Co.	20	Cane	60,000	St. un.	Am. Car & Fdy.

Passenger Car Orders in 1918—Domestic

Purchaser	No.	Class	Con- struction	Builder
Am. Smelt. & Ref. Co.	1	Caboose type passenger car	Wood	McKeen
Bevier & Southern	1	Coach	Wood	Am. Car & Fdy.
Brooklyn Rapid Transit	2	Pass. bodies	Steel	Am. Car & Fdy.
Duluth & Iron Range	5	Coaches	.....	Pullman
New York Municipal	100	Subway	Steel	Am. Car & Fdy.

Canadian

Purchaser	No.	Class	Con- struction	Builder
Canadian Gov't Rys.	14	Sleeping	.....	Pullman
	7	Dining	.....	Pullman
Canadian Pacific	1	Official	Steel	Pullman

Export

Purchaser	No.	Class	Con- struction	Builder
Chandler & Co.	1	1st class	Wood	Am. Car & Fdy.
Chandler & Co.	1	2nd class	Wood	Am. Car & Fdy.
Colombian Northern	2	3rd class	Wood	Am. Car & Fdy.
Dollar, Robert, Company	3	Din. & sleep.	Wood	Am. Car & Fdy.
Guantanamo & Western	2	3rd class	Wood	Am. Car & Fdy.
Lunghai Ry. Co.	4	3rd class	Wood	Am. Car & Fdy.
United Rys. of Yucatan	3	1st class	St. un.	Am. Car & Fdy.
Guantanamo & Western	1	1st class	St. un.	Am. Car & Fdy.
United Rys. of Yucatan	2	1st class	St. un.	Am. Car & Fdy.
	3	1st class	St. un.	Am. Car & Fdy.
	4	Mail & exp.	St. un.	Am. Car & Fdy.

Electric Locomotive Headlights—Wayfarers along the line of the New York & Long Branch Railroad have recently been startled by headlights of certain night trains which throw rays of equal power to those of many naval searchlights. Older hands among them privately express some doubt as to the merit of the arrangement since for several years the practice on the well fenced railroads of the East has been to get away from the powerful oil reflectors of the early days of railroading. Some engine drivers say that the brilliant rays tend to confuse signal lamps which they and trackmen must observe. They admit that if a large white church or a man of war in holiday paint were to stray upon the track in front of a fast express, the glaring headlights might enable them to see it in time to stop unless they were making up time on a downgrade.—*New York Times*.

Specialties for Standard Cars and Locomotives

Data Revised to Date and Arranged in Tabular
Form for Ready Reference

THE SPECIALTIES applied to the standard cars and locomotives built for the Railroad Administration have been published in the *Railway Age* from time to time during the year. The first list was given in the June 14 issue, page 1448; and the second list on page 1540 of the June 21 issue; with an additional list on page 1586 of the June 28 issue. These lists gave in general the amounts of the various specialties ordered, and in order to give a better idea of the distribution of the use of these specialties among the various classes of equipment the accompanying tables have been compiled. A few minor changes were made

in the original lists showing the distribution of the orders, primarily on account of delivery.

The companies receiving orders for the specialties for the locomotives are shown in the table under the various specialty items and on which class of power these specialties are used. In case one specialty is used on all locomotives, such as the American Arch Company arch, it is so designated.

The table showing the specialties for the cars includes only those for the cars which have been built thus far, as information is not obtainable as to just which of the specialties will be applied to the other cars.

SPECIALTIES FOR THE STANDARD LOCOMOTIVES													
	All loco- motives	Mikado		Mountain		Pacific		Santa Fe		Switcher		Mallet	
		Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	0-6-0	0-8-0	2-6-6-2	2-8-8-2
Air Brake—													
Westinghouse Air Brake Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
New York Air Brake Co.....	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Arch—													
American Arch Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bell Ringer—													
Harry Vissering & Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Blow-off Cock—													
Everlasting Valve Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Southern Loco. Valve Gear Co.....	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No
Okadee Co.....	Yes	Yes	No	No	No	No	No	No	Yes	Yes	No	Yes	Yes
Blower Fitting—													
Barco Manufacturing Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bolster—Tender Truck—													
Pittsburgh Steel Foundries.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brake—													
American Brake Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brake Beams—Tender Truck—													
Chicago Railway Equip. Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brake Beam Support—													
Chicago Railway Equip. Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brake Shoes—													
American Brake Shoe & Foundry Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Buffer—Radial—													
Franklin Railway Supply Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bumper—Front—													
Commonwealth Steel Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bushings—Cylinder and Valve—													
Hunt-Spiller Mfg. Corp.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cellars—Driving Box—													
Franklin Railway Supply Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coal Pusher—													
Locomotive Stoker Co.....	Yes	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No
Coupler—													
National Mall. Cast. Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coupler Yoke—													
Buckeye Steel Castings Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Crosshead Shoes—													
Hunt-Spiller Mfg. Corp.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Draft Gear—													
Westinghouse Air Brake Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dust Guards—													
W. N. Thornburg Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fire Door—													
Franklin Railway Supply Co.....	Yes	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No
National Railway Device Corp.....	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Frame—Tender—													
Commonwealth Steel Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame—Tender Truck Side—													
American Steel Foundries.....	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Buckeye Steel Castings Co.....	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Gages—Steam—													
Ashcroft Mfg. Co.....	Yes	Yes	Yes	No	Yes	No	No	No	Yes	Yes	No	No	Yes
Ashton Valve Co.....	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	No
Gages—Steam Heat—													
Ashton Valve Co.....	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Gages—Water—													
Sargent Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gage Cocks—													
Nathan Mfg. Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grate Shaker—													
Franklin Railway Supply Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Headlight Case—													
Schroeder Headlight & Gen. Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Handlon & Buck Mfg. Co.....	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes	Yes
Adams & Westlake Co.....	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No
Headlight Equipment—													
Fyle National Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Schroeder Headlight & Gen. Co.....	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	No	No
Injectors—													
Nathan Mfg. Co.....	Yes	Yes	No	No	No	No	No	No	No	Yes	No	Yes	No
Hancock Inspirator Co.....	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes
Ohio Injector Co.....	Yes	No	No	No	No	No	No	Yes	No	No	No	No	No
Joints—Metallic Pipe—													
Barco Manufacturing Co.....	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Franklin Railway Supply Co.....	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	No	No
Greenlaw Mfg. Co.....	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No
Lubricator—													
Nathan Mfg. Co.....	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Detroit Lubricator Co.....	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Lubricator—Driving Box—													
Franklin Railway Supply Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	All loco- motives	Mikado		Mountain		Pacific		Santa Fe		Switcher		Mallet	
		Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	0-6-0	0-8-0	2-6-6-2	2-8-8-2
Oil Cups—Guide, Piston Rod, Valve Stem—													
Hancock Inspirator Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packing—Piston & Valve Rod—													
United States Metallic Pack. Co.....	...	Yes	Yes	No	No	No	Yes	No	No	Yes	No	No	No
Paxton-Mitchell Co.....	...	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Packing Rings—Cylinder and Valve—													
Hunt-Spiller Mfg. Corp.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reverse Gear—													
Ragonnet (Frank. Ry. Sup. Co.).....	...	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes
Lewis (Commonwealth Sup. Co.).....	...	No	Yes	Yes	No	No	No	No	Yes	No	No	Yes	No
Mellin (Am. Loco. Co.).....	...	No	No	No	No	No	No	No	No	Yes	No	No	No
Brown (Sou. Loco. Valve Gear Co.).....	...	No	No	No	No	No	No	No	No	No	Yes	No	No
Safety Bar (Unit)—													
Franklin Railway Supply Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sanders—													
U. S. Metallic Packing Co.....	...	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Hanlon Loco. Sander Co.....	...	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	No	No
Harry Vissering & Co.....	...	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Side Bearing—Tender—													
E. S. Woods & Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Spring—													
Crucible Steel Co.....	...	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Pt. Pitt Spring & Mfg. Co.....	...	No	Yes	No	No	No	No	No	Yes	Yes	No	Yes	Yes
Pittsburgh Spring & Steel Co.....	...	Yes	No	No	No	Yes	No	No	Yes	No	No	No	No
Railway Steel Spring Co.....	...	Yes	Yes	No	No	No	No	No	No	Yes	No	No	No
Standard Steel Works.....	...	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	No
Union Spring & Mfg. Co.....	...	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Sprinkler—													
Wm. Sellers Co., Inc.....	...	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
Hancock Inspirator Co.....	...	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stoker—													
Locomotive Stoker Co.....	...	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
Standard Stoker Co.....	...	No	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No
Hanna Loco. Stoker Co.....	...	No	No	No	No	No	No	No	Yes	No	No	No	No
Superheater—													
Locomotive Superheater Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Throttle Valve—													
Chambers Valve Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Truck—Trailer—													
Hodges (Baldwin Loco. Works).....	...	Yes	No	No	No	No	No	No	No	No	No	No	No
Cole-Scoville (Am. Loco. Co.).....	...	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Uncoupling Device—													
Imperial Appliance Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valves—Blower—													
Sargent Company.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valve Gear—													
Walschaert.....	...	Yes	Yes	No	No	No	No	No	No	No	No	No	No
Pilliod Co. (Baker).....	...	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Southern Loco. Valve Co.....	...	No	No	No	No	No	No	Yes	Yes	No	No	No	No
Valve—Check—													
Nathan Mfg. Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valve—Piston—													
American Balanced Valve Co.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valve—Safety—													
Consolidated Safety Valve Co.....	...	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
Coale Muffler & Safety Valve Co.....	...	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No
Ashton Valve Co.....	...	No	No	No	No	No	No	No	Yes	No	No	No	Yes
Valve—Steam Heat—													
Vapor Car Heating Co., Inc.....	...	No	No	Yes	No	Yes	No	No	No	No	No	No	No
Leslie Co.....	...	No	No	No	Yes	No	Yes	No	No	No	No	No	No
Ventilator—Cab—													
Rushton (Bald. Loco. Works).....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wheels—Rolled Steel—													
Forged Steel Wheel Co.....	...	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Standard Steel Works.....	...	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

SPECIALTIES FOR STANDARD CARS THUS FAR BUILT

	D. S. Box	S. S. Box	Comp. Gon.	55-Ton Hopper	L. S. Gon.		D. S. Box	S. S. Box	Comp. Gon.	55-Ton Hopper	L. S. Gon.
Angle Cock Holders—						Davis' 3d Point Suspension—					
Western Railway Equipment Co...	Yes	Yes	Yes	Yes	Yes	Chicago Railway Equipment Co....	Yes	Yes	Yes	Yes	Yes
Bearing, Journal—						Door Fixtures (Slide)—					
Magus.....	Yes	Yes	Yes	Yes	Yes	Camel Company.....	No	Yes	No	No	No
Keystone.....	Yes	Yes	Yes	Yes	Yes	Draft Gear, Friction—					
Haskel & Barker.....	Yes	Yes	Yes	Yes	No	Westinghouse Air Brake Co.....	Yes	Yes	Yes	Yes	Yes
Ajax.....	Yes	Yes	Yes	Yes	Yes	Standard Coupler Co.....	Yes	Yes	Yes	Yes	Yes
Bostwick & Lyons.....	Yes	Yes	Yes	Yes	No	Union Draft Gear Co.....	Yes	Yes	Yes	Yes	Yes
Bearings, Lick Frictionless—						Keyoke Railway Equipment Co....	Yes	Yes	Yes	Yes	Yes
Wine Railway Appliance Co.....	Yes	No	Yes	No	No	Dust Guards—					
E. S. Woods & Co.....	No	Yes	Yes	No	No	Wm. N. Thornburgh Co.....	Yes	Yes	Yes	Yes	Yes
A. Stucki Co.....	No	No	Yes	Yes	Yes	Ends, Pressed Steel—					
Bolsters, Truck—						Pressed Steel Mfg. Co.....	Yes	Yes	Yes	No	No
American Steel Foundries.....	Yes	Yes	Yes	Yes	Yes	Chicago & Cleveland Car Roof Co..	No	No	Yes	No	No
Buckeye Steel Castings Co.....	Yes	Yes	Yes	Yes	Yes	Frames, Truck—					
Gould Coupler Co.....	Yes	Yes	Yes	Yes	No	American Steel Foundries.....	Yes	Yes	Yes	Yes	Yes
Scullin Steel Co.....	Yes	Yes	Yes	Yes	No	Bettendorf Co.....	Yes	Yes	Yes	Yes	No
Bettendorf Co.....	No	Yes	Yes	Yes	No	Buckeye Steel Cast. Co.....	Yes	Yes	Yes	Yes	Yes
Boxes, Journal—						Gould Coupler Co.....	Yes	Yes	Yes	Yes	No
National Mall. Cast. Co.....	Yes	Yes	Yes	Yes	Yes	Scullin Steel Co.....	Yes	Yes	Yes	Yes	No
Gould Coupler Co.....	Yes	Yes	Yes	Yes	Yes	Hose, Air Brake—					
American Mall. Cast. Co.....	Yes	Yes	Yes	Yes	No	New York Air Brake Co.....	Yes	No	No	No	No
Union Spring & Mfg. Co.....	Yes	Yes	Yes	Yes	Yes	Westinghouse Air Brake Co.....	No	Yes	Yes	Yes	Yes
T. H. Symington Co.....	Yes	Yes	Yes	Yes	No	Uncoupling Device—					
Brakes, Air—						Imperial Appliance Co.....	Yes	Yes	Yes	Yes	Yes
New York Air Brake Co.....	Yes	No	No	No	No	Wedges, Journal Box—					
Westinghouse Air Brake Co.....	No	Yes	Yes	Yes	Yes	Western Railway Equipment Co...	Yes	Yes	Yes	Yes	Yes
Brake Beams, Tender—						Wheels, Cast Iron—					
Buffalo Brake Beam Co.....	Yes	Yes	No	Yes	No	Brass Foundry & Machine Co....	Yes	Yes	Yes	Yes	No
Davis Brake Beam Co.....	Yes	No	Yes	Yes	Yes	Louisville Car Wheel & Supply Co.	Yes	Yes	Yes	No	No
American Steel Foundries.....	Yes	No	Yes	No	No	Albany Car Wheel Co.....	Yes	Yes	Yes	No	No
Joliet Railway Equipment Co.....	Yes	Yes	Yes	Yes	No	Southern Car Wheel Co.....	Yes	Yes	Yes	Yes	No
Damascus Brake Beam Co.....	Yes	No	Yes	Yes	No	New York Car Wheel Co.....	Yes	Yes	Yes	No	No
Haskel & Barker.....	Yes	Yes	Yes	No	No	Ramapo Car Wheel & Foundry Co..	Yes	Yes	Yes	Yes	No
Pressed Steel Car Co.....	Yes	No	No	Yes	Yes	Buffalo Car Wheel & Foundry Co..	Yes	Yes	Yes	Yes	No
Chicago Railway Equipment Co...	No	Yes	Yes	Yes	No	Brown Car Wheel Works.....	Yes	Yes	Yes	No	No
Brake Shoes—						Griffin Car Wheel Works.....	Yes	Yes	Yes	Yes	Yes
American Brake Shoe & Fdry. Co.	Yes	Yes	Yes	Yes	Yes	Western Steel Car Co.....	Yes	Yes	Yes	No	No
Couplers—						Standard Car Wheel Co.....	Yes	Yes	Yes	No	No
American Steel Foundries.....	Yes	Yes	Yes	Yes	Yes	National Car Wheel Co.....	Yes	Yes	Yes	Yes	No
Buckeye Steel Casting Co.....	Yes	Yes	Yes	Yes	Yes	Wheels, Steel—					
Gould Coupler Co.....	Yes	Yes	Yes	Yes	Yes	Standard Forged Steel.....	No	No	No	Yes	Yes
McConway & Torley.....	Yes	Yes	Yes	Yes	Yes	Pressed Steel (Carnegie).....	No	No	No	Yes	Yes
National Mall. Cast. Co.....	Yes	Yes	Yes	Yes	Yes	Yokes, Draw Bar—					
						Buckeye Steel Castings Co.....	Yes	Yes	Yes	Yes	Yes
						Union Draft Gear Co.....	Yes	Yes	Yes	Yes	Yes

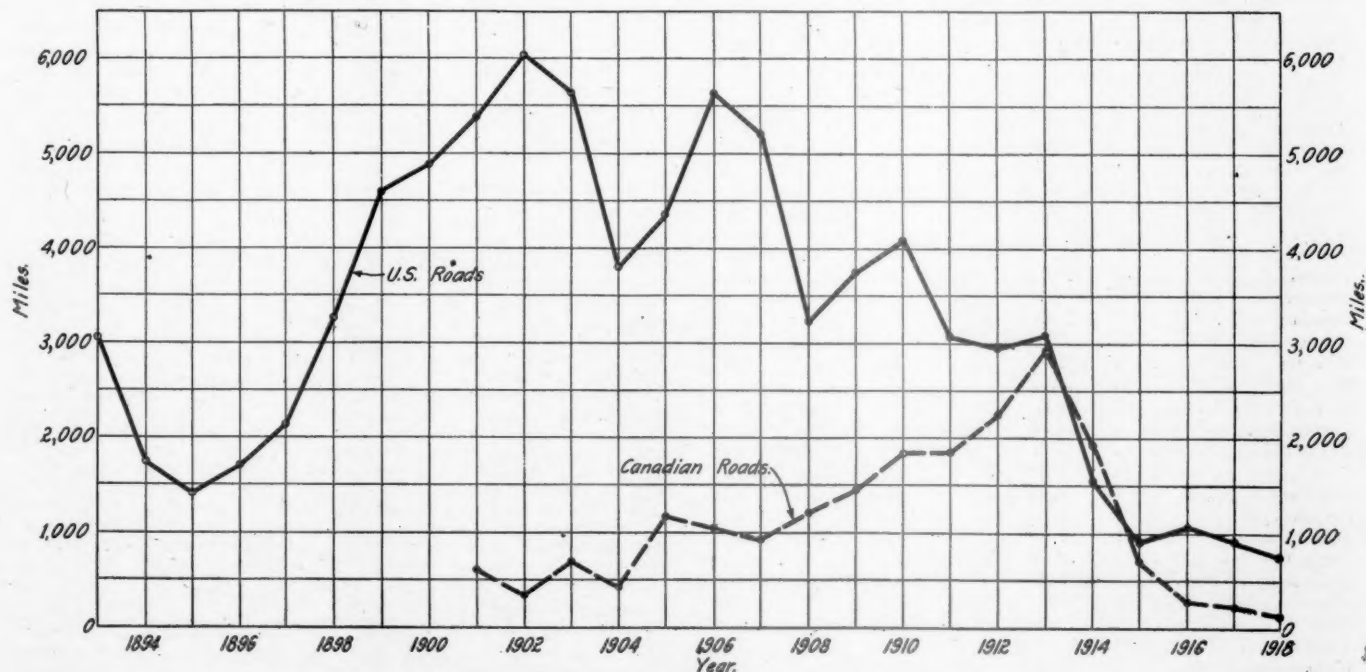


Only a Small Addition to Main Track Mileage

Large Expenditures for Construction During 1918 Devoted
Mostly to Terminal Facilities

IN TERMS OF MAIN TRACK completed and placed in service, railroad construction in the United States during 1918 amounted to less than at any time since the Civil War. Only 721.57 miles of new line was completed during the past year in the United States and only 135.08

years. This will be confirmed by an examination of the detail data which lists the amount of first track, second track, etc., completed during the past year, and gives also, under the heading of other important work under construction, the other projects of railroad work authorized,



Curves of Mileage Built in the United States and Canada Since 1893

miles in Canada. As shown by the diagram, these figures are far below those of any other year during the last 25. However, based on total expenditures authorized, railroad construction in the United States ranks well with recent

including in this the construction of main tracks on which work has not been completed. This list includes only projects costing \$100,000 or more, upon which work has been started, but excludes authorized work not yet started.

The amount of second track completed is larger than last year or any year since 1914, but is only about half the mileage completed in 1913. The total for multiple tracks in the United States includes third track, 76.95 miles, fourth, fifth and sixth tracks, 57.43 miles. In Canada only

MILES OF NEW LINE COMPLETED IN THE UNITED STATES SINCE 1893.

1893	3,024	1906	5,623
1894	1,760	1907	5,212
1895	1,420	1908	3,214
1896	1,692	1909	3,748
1897	2,109	1910	4,122
1898	3,265	1911	3,066
1899	4,569	1912	2,997
1900	4,894	1913	3,071
1901	5,368	1914	1,532
1902	6,026	1915	933
1903	5,652	1916	1,098
1904	3,832	1917	979
1905	4,388	1918	721

4.28 miles of second track was completed, with no additions to other than first and second main tracks.

In the United States the new mileage of first main tracks includes 59.7 miles on the Atlantic Coast Line in Florida, 53 miles on the Government Railway in Alaska, and 48 miles on the Gulf, Mobile & Northern in Mississippi and Tennessee. Most of the mileage of new lines, however, is in short sections, and a considerable portion is in connection with the development of coal lands.

Second-track work includes 64.05 miles on the South-

ern; 60.77 on the Santa Fe Coast Line from Goffs to Cadiz, Cal.; some 63 miles in short stretches on the Great Northern, and 48½ miles similarly divided on the Atchison, Topeka & Santa Fe. In general, the new second track mileage is in short stretches, following the policy of the Railroad Administration to secure additional mileage of second track where it could be obtained with the least effort. This applies also to the additions to multiple main tracks.

In contrast with the greatly decreased activity in the construction of new lines, the roads authorized more than the usual amount of improvement work along existing lines. The congestion of last winter, particularly on the eastern roads, demonstrated forcefully the need for more facilities, particularly for the care of locomotives at terminals. As a result a record-breaking amount of work of this character was undertaken this year, as indicated by the fact that the Pennsylvania Railroad alone had under way over 200 projects involving expenditures of over \$100,000 each and ranging from that figure up to \$5,000,000.

While the necessity for so large an amount of such work is indicative of the starvation policy to which the roads have been subjected during recent years, it also demonstrates the gradual transition from the extensive to the intensive development of our transportation system. While relatively large areas in the far west are still without proper transportation facilities, it is to be expected that expenditures for railway work will, in the future, be diverted in increasingly large proportions to improvements along exist-

NEW TRACK BUILT IN 1918.

UNITED STATES—	No. Cos. building	First track	Second track	Third track	Fourth or more track	Total
Alabama	1	7.60	.....	.....	.....	7.60
Alaska	1	53.00	.....	.....	.....	53.00
Arizona	1	55.00	1.97	.....	.....	56.97
California	3	40.09	60.77	.....	.....	100.86
Colorado	3	9.55	4.87	.....	.....	14.42
Connecticut	..	.....	.....	.....	2.00	2.00
Florida	4	104.78	1.75	.....	.....	106.53
Georgia	2	15.10	23.50	.....	.....	38.60
Idaho	1	10.84	.....	.....	.....	10.84
Illinois	3	5.40	23.37	3.00	18.00	49.77
Indiana	1	42.10	23.70	6.34	.....	72.14
Iowa	..	.....	9.12	.....	.....	9.12
Kansas	2	34.80	37.45	6.45	.....	78.70
Kentucky	1	12.28	9.00	.....	.....	21.28
Louisiana	1	3.00	3.01	.....	.....	6.01
Maryland	1	6.20	7.87	2.83	4.27	21.17
Maine	..	0.71	7.47	5.96	0.36	14.50
Massachusetts	1	0.17	2.42	4.44	0.50	7.53
Michigan	..	.....	0.66	.....	.....	0.66
Minnesota	..	.....	43.49	4.26	4.25	52.00
Mississippi	1	30.00	8.80	.....	.....	38.80
Missouri	1	1.01	13.27	.....	.....	14.28
Montana	..	.....	57.71	1.07	1.16	59.94
Nebraska	..	.....	13.58	.....	.....	13.58
New Jersey	2	5.93	7.24	4.33	5.78	23.28
New Mexico	..	.....	12.08	.....	.....	12.08
New York	5	6.57	30.31	12.29	4.89	54.06
North Carolina	2	6.30	15.83	.....	.....	22.13
North Dakota	..	.....	4.36	.....	.....	4.36
Ohio	1	8.00	94.70	19.20	15.62	137.52
Oklahoma	2	6.28	.....	.....	.....	6.28
Oregon	3	8.94	.....	.....	.....	8.94
Pennsylvania	7	45.80	34.03	6.78	0.60	87.21
South Carolina	1	38.80	41.72	.....	.....	80.52
Tennessee	2	20.00	4.00	.....	.....	24.00
Texas	3	39.70	20.96	.....	.....	60.66
Utah	2	16.13	.....	.....	.....	16.13
Virginia	2	11.38	8.00	.....	.....	19.38
Washington	2	7.53	2.30	.....	.....	9.83
West Virginia	5	60.57	32.19	.....	.....	92.76
Wisconsin	1	5.00	.....	.....	.....	5.00
Wyoming	2	3.01	20.05	.....	.....	23.06
Totals	70	721.57	681.55	76.95	57.43	1,537.50
Canada	..	135.08	4.28	.....	.....	139.36
Mexico	..	10.00	.....	.....	.....	10.00

NEW TRACK BUILT IN 1917.

UNITED STATES—	No. Cos. building	First track	Second track	Third track	Fourth or more track	Total
Alabama	2	6.30	36.64	.....	.....	42.94
Alaska	1	108.00	.....	.....	.....	108.00
Arkansas	3	10.05	.....	.....	.....	10.05
California	7	108.89	.....	.....	.....	108.89
Colorado	1	.62	3.77	.....	.....	4.39
Connecticut	1	.21	.....	.45	3.50	4.16
Florida	1	5.00	.....	.....	.....	5.00
Georgia	3	18.43	23.71	.....	.....	42.14
Idaho	2	23.36	.....	.....	.....	23.36
Illinois	4	9.01	24.89	11.80	4.10	49.80
Indiana	..	.....	47.85	.....	.....	47.85
Kansas	1	21.50	27.12	.....	.....	48.62
Kentucky	3	29.80	13.20	1.09	.....	44.09
Louisiana	5	39.80	.....	.....	.....	39.80
Maryland	1	1.68	6.70	.....	.....	8.38
Massachusetts	..	.....	.....	1.21	1.99	3.20
Michigan	4	7.83	2.13	.....	.....	9.96
Minnesota	1	11.75	22.14	.....	.....	33.89
Mississippi	4	28.42	12.50	.....	.....	40.92
Missouri	2	3.55	.79	.....	.....	4.34
Montana	2	94.40	36.00	.....	.....	130.40
Nevada	2	10.00	.....	.....	.....	10.00
New Jersey	2	2.70	3.96	4.83	3.31	14.80
New Mexico	1	.16	5.11	.....	.....	5.27
New York	3	3.74	8.45	12.50	12.46	37.15
North Carolina	5	16.85	4.50	.....	.....	21.35
Ohio	1	27.19	18.18	.....	.....	45.37
Oklahoma	3	23.80	18.20	.....	.....	42.00
Oregon	2	17.00	.....	.....	.....	17.00
Pennsylvania	15	61.89	21.62	2.70	1.77	87.98
South Carolina	1	21.50	82.90	.....	.....	104.40
South Dakota	1	.19	.....	.....	.....	.19
Tennessee	4	27.81	.70	.....	.....	28.51
Texas	3	63.50	41.35	.....	.....	104.85
Utah	2	67.20	15.82	.....	.....	83.02
Virginia	3	19.73	33.35	.....	.....	53.08
Washington	3	13.68	.....	.....	.....	13.68
West Virginia	6	35.54	6.72	.....	.....	42.26
Wisconsin	2	29.99	.....	1.20	1.24	32.43
Wyoming	1	7.81	95.11	.....	.....	102.92
Totals	108	978.88	613.41	35.78	28.37	1,656.44
Canada	6	206.95	.....	.....	.....	206.95

ing lines intended to modernize and to increase their capacities.

The inauguration of federal control introduced an element of uncertainty early in the year which greatly retarded the inauguration of new projects. Work was in general continued on those projects which were already under way, but the necessity of securing federal approval for new work seriously delayed its inauguration. Facing a labor shortage, many roads had planned to undertake their improvement program as early in the spring as weather conditions would permit, but the work of organizing the Division of Capital Expenditures so delayed the issuance of approvals that it was late in May before any considerable number of projects were authorized. Then the entrance of many roads with large budgets into the market for labor and materials further complicated the inauguration of the work which was approved. As a result, out of the total of \$1,199,426,026 of Additions and Betterments work, charge-

able to capital account which had been authorized up to November 1, less than one-half is now completed.

Owing to the lateness of the season at which this work was authorized, many expedients have been undertaken to secure its completion. A premium has been placed on short construction periods and every effort has been made to finish as much of the work as possible before winter. This has been particularly true of engine terminals which were so badly needed last winter.

While the uncertainty as to the disposition of the roads makes any prediction as to the outlook for construction activities during 1919 extremely hazardous, the large amount of work now under way and unfinished will, if carried to completion, provide a fairly busy year in itself. With the further improvements which must be made, the director general estimated recently that the roadway improvement work alone (excluding equipment) would aggregate \$550,000,000 next year.

Railroad Construction in the United States in 1918

Alabama & Vicksburg

Bridge over Big Black river, in Mississippi, cost \$174,000 completed.

Alabama Great Southern

Second Track: Between Russell, Miss., and Toomsuaba, 8.8 miles.

Other Important Work Under Construction: Second track from Burstall, Ala., to Vance, 31.9 miles, 90 per cent completed; Warrior River Bridge at Eutaw, Ala., cost \$237,475 completed.

Alaska Railroad

First Track: Between Seward, Alaska, and Fairbanks, 53.00 miles.

Other Important Work Under Construction: Building in Alaska, from mile 224 to mile 265, 41 miles; mile 365 to mile 380, 15 miles standard gage, and from mile 414 to mile 456, 42 miles of narrow gage.

Americus & Atlantic

First Track: Between Mata, Ga., and Methvins, 2.00 miles.

Apache Railroad

First Track: Holbrook, Ariz., to Duke's Peak, 55.00 miles.

Ashland, Odanah & Marengo

First Track: In Wisconsin, not specified, 5.00 miles.

Atchison, Topeka & Santa Fe

First Track: Washington, Okla., to Cole, 3.28* miles.

Second Track: La Junta, Colo., to Casa, 4.87 miles; Dodge City, Kans., to Wright, 7.64 miles; Dodge City to Seare, 4.46 miles; White to Augusta, 4.00 miles; Winfield to Arkansas City, 4.00 miles; Decatur, N. M., to Glorieta, 4.98 miles; Camden Junction, Mo., to Floyd, 2.57 miles; at Shopton, Iowa, 1.52 miles; Albuquerque, N. M., to Hahn, 4.00 miles; Gallup, N. M., 3.1 miles; Western division, Kan., M. P., 344 to 352, 7.45 miles; total, 48.59 miles.

Third Track: Turner, Kan., to Holliday, 6.45 miles.

*Change of line.

Other Important Work Under Construction: Illinois division, change in line, 0.28 miles, cost \$110,870, 30 per cent completed; second track mile posts, 418-422, Missouri division, 3.47 miles, cost \$551,551, 80 per cent completed. Unclaimed freight building at Topeka, Kan., cost \$310,825 completed; second track and change of line and grade, 11.82 miles, from Arkansas City, Kan., to Newkirk, Okla.; second track, from Eldorado, Kan., to Augusta, 9.9 miles, cost \$351,559, 16 per cent completed; second track, from Winfield, Kan., to Arkansas City, 12.3 miles, cost \$603,654, 19 per cent completed; extension of Bartlesville branch and terminals at Tulsa, Okla., cost \$815,000; new track and yard change at Hutchinson, Kan., cost \$143,518 completed; second track, 4.45 miles, at Dodge City, Kan., cost \$148,579, 50 per cent completed; engine terminal at Las Vegas, N. M., cost \$236,857, completed; reconstruction of bridge at Pinta, Ariz., cost \$157,022 completed; shop and station facilities at Gallup, N. M., cost \$616,066 completed; car shops and lumber shed at San Bernardino, Cal., cost \$402,975 completed; spur to U. S. cantonment at Camp Kearney, Cal., cost \$382,098 completed; new depot and track at San Bernardino, Cal., cost \$831,547 completed.

Atchison, Topeka & Santa Fe Coast Lines

Second Track: Goffs, Cal., to Cadiz, 60.77 miles.

Atlanta & West Point

Second Track: College Park, Ga., to Palmetto, 17 miles, completed.

Atlantic Coast Line

First Track: Sebring, Fla., to Moore Haven, 59.70 miles.

Other Important Work Under Construction: James River bridge, Richmond, Va., cost \$231,117, 58 per cent completed; additional freight facilities, Richmond, Va., cost \$360,882, 50 per cent completed; new passenger station at Norfolk, Va., cost \$155,450, completed; single track, extension of Haines City branch 81 miles, between Sebring and Immokalee, Fla., cost \$1,000,000, 44 per cent completed.

Baltimore & Ohio System

First Track: Penn Mary, Md., to Bear Creek, 4.80 miles; West Baltimore to Washington Road, 1.40 miles; North Dayton, O., connecting track between Wellston branch and main line; branch line at Great Cacapon, W. Va.; connection with Coal & Coke Ry., at Hampton, W. V.

Second Track: Evans, Pa.; Holloway, Ohio, to Flushing; Carlisle, Ohio, 11 miles; Defiance, Ohio, 1.30 miles.

Third Track: At Philadelphia, Pa., 0.60 miles.

Fourth Track, At Philadelphia, Pa., 0.60 miles.

Other Important Work Under Construction: Additions to Clearmont yard, Baltimore, Md., cost \$160,000, completed; Annapolis Junction, Md., to Admiral, tracks and other facilities for Camp Meade, cost \$408,120, completed; diversion of main lines through Cumberland, Md., cost \$225,000, 80 per cent completed; additional yard tracks at Keyser, W. Va., cost \$150,000, 80 per cent completed; rearrangement and standardization of fourth track line, from Bailey's to W. Baltimore, Md., cost \$200,000, 40 per cent completed; track to Camp Sherman, at Chillicothe, Ohio, cost \$191,692 completed; second track, 23.3 miles, from Milford Junction to La Paz Junction, Ohio, cost \$785,957, 85 per cent completed; second track, Storrs, Ohio, to Culloms, 2.20 miles, cost \$208,007, 44 per cent completed; reconstruction of bridges from Cook's Mill, Pa., to Sand Patch, cost \$191,200 completed; construction of bridge superstructures from Sand Patch to Collensville, cost \$104,500, 96 per cent completed; strengthening bridges from Uniontown, Pa., to Cheat Haven, cost \$325,380, 90 per cent completed; constructing bridge No. 315, at Etna, Pa., cost \$102,000; construction of Astor Bridge at Flemington, W. Va., cost \$478,900 completed; Baltimore, Md., construction of yard at Mt. Winans, cost \$700,000, 85 per cent completed; enlargement of Bay View yards, cost \$160,000, 80 per cent completed; heavy repair shops, Glenwood, Pa., cost \$1,732,605, 70 per cent completed; additions to round house at Brunswick, Md., cost \$125,000, 84 per cent completed; additions to round house at Grafton, W. Va., cost \$175,000, 78 per cent completed; erection of heavy repair shops at Cumberland, Md., cost \$1,216,000, 65 per cent completed; Thawing house at Curtis Bay, Baltimore, Md., cost \$100,000, completed; reconstruction of bridges from Cuba to Orient, Ohio, cost \$249,130, completed; engine terminal facilities at De Forest Junction, Ohio, cost \$146,280, 80 per cent completed; 12 additional stalls to round house at Garrett, Ind., cost \$155,000, completed; a new power plant at Garrett, Ind., completed; 8-stall engine house at Ivorydale, Ohio, cost \$130,637, 90 per cent completed; engine terminal improvements at Lorain, Ohio, cost \$101,790, 5 per cent completed; rebuilding bridge No. 3, at North Dayton, Ohio, cost \$407,832, completed; new receiving yard at North Dayton, cost \$116,186, completed; engine house remodeling, at South Chicago, cost \$106,700, 5 per cent completed; extending engine house at Storrs, Ohio, cost \$100,050, 5 per cent completed; enlarging engine house at Stock Yards, Ohio, cost \$100,000, 91 per cent completed; freight house, office, etc., at Parkersburg, W. Va., cost \$268,013, completed; five additional stories on freight house at Allegheny, Pa., cost \$228,000 completed; transfer bridge pier 10, at Locust Point, Baltimore, Md., cost \$137,833, completed.

Barton County & Santa Fe (A. T. & S. Fe.)

First Track: In Kansas not specified, 31.20 miles.

Bay Point & Clayton

Other Important Work Under Construction: Extension to Bay Point, Cal., including overhead crossing over the Santa Fe and Southern Pacific, cost \$100,000, work not started but expected to be finished by June, 1919.

Bessemer & Lake Erie

First Track: Deer Creek Junction, Pa., branch to new mines of Inland Steel Company, 1.60 miles.

Second Track: Henlein, Pa., to Kremis, 2.00 miles; Blacks Run to River Valley, 1.00 mile; total 3.00 miles.

Other Important Work Under Construction: Deer Creek Junction, Pa., branch to new mines of Inland Steel Co., 2.54 miles, cost \$410,000, 50 per cent completed; change of grade and alignment, Pardoe to Cool Spring, cost \$1,828,055, 45 per cent completed; Blacks Run to River Valley, Pa., double track bridge over Allegheny river, Pennsylvania Railroad and highways with approaches, cost \$2,149,112, 96 per cent completed; K. O. Junction, new yard tracks, cost \$378,711, completed; enlargement of yard and facilities

at Conneaut Harbor, O., cost \$209,316, completed; change of grade and alignment at Rural Ridge, Pa., cost \$290,000, 45 per cent completed; change of grade and alignment from Culmerville to bridge No. 7, Pa., cost \$1,617,778, 70 per cent completed; change of grade and alignment from Harrisville, Pa., to Grove City, Pa., cost \$896,000, 31 per cent completed (work held up, continuation undecided); change of grade and alignment at Hartstown, Pa., cost \$490,000, 91 per cent completed (work deferred); North Bessemer, Pa., new 400-ton coaling plant and tracks, cost \$160,000, 59 per cent completed.

Black Mountain Railway

First Track: In North Carolina, not specified, 2.30 miles.

Black Mountain Railroad

Other Important Work Under Construction: Grading completed on 8 miles and ready for track laying between Hulen, Ky., and head of Packets Creek.

Boston & Albany

Other Important Work Under Construction: Reconstruction of draw-bridge over Chelsea river at Chelsea, Mass., cost \$280,300, 35 per cent completed; renewal of bridge over North Elm street and public square at Westfield, cost \$250,000, 6 per cent completed.

Boston & Maine

Second Track: From North Chelmsford, Mass., to West Chelmsford, 2.25 miles.

Third Track: From Westminster, Mass., to South Ashburnham, 3.94 miles; Cummings, Me., to North Berwick, 5.64 miles.

Other Important Work Under Construction: Rebuilding bridge No. 180, at Zoar, Mass., cost \$215,000, 28 per cent completed; rebuilding bridge No. 154, at Greenfield, Mass., cost \$308,500, 60 per cent completed; rebuilding bridge No. 108, at Saco, Me., cost \$105,000, 15 per cent completed; improvements in yard and signals at Boston, Mass., cost \$148,812, nearing completion; engine house and yard facilities at Rotterdam, N. Y., cost \$643,000, 23 per cent completed; engine house and yard facilities at Lowell, Mass., cost \$1,000,000, 14 per cent completed; engine house facilities at East Deerfield, Mass., cost \$800,000, 40 per cent completed; rebuilding bridge No. 148, East Deerfield, cost \$274,000, completed; engine house and facilities, East Cambridge, cost \$171,000, nearing completion; additional yard facilities, Lawrence, cost \$100,000, completed.

Buffalo Creek

First Track: At Buffalo, N. Y., 0.18 mile.

Buffalo, Rochester & Pittsburgh

Second Track: In Pennsylvania, at Falls Creek, 0.18 mile; from Marion Center, Pa., 2.6 miles.

Other Important Work Under Construction: Shop terminal facilities, at East Salamanca, N. Y., cost \$706,500, completed; additional yard tracks at East Salamanca, cost \$133,245, completed; shop terminal facilities at Elk Run Junction, cost \$696,606, completed.

Carolina & Northeastern

First Track: Rehoboth, N. C., to Lasker, 4.00 miles.

Catasauqua & Fogelsville

Other Important Work Under Construction: At Guth, Pa. (Jordan Bridge), replacing viaduct with 3-span arch and filling at cost of \$150,000, 83 per cent completed.

Central New England

Second Track: Highlands and Reynolds branch, N. Y.

Other Important Work Under Construction: Strengthening Poughkeepsie Bridge, Poughkeepsie, N. Y., cost \$370,000, completed.

Central of New Jersey

Third Track: Between North Branch, N. J., and White House, 4.07 miles.

Fourth Track: Between North Branch, N. J., and White House, 4.07 miles.

Other Important Work Under Construction: Elimination of grade crossing, Westfield, N. J., cost \$303,157, 88 per cent completed; additional yard tracks, Newark, N. J., cost \$118,584, completed; Broad street terminal, Newark, N. J., cost \$632,663, completed; extra power house, Ashley, Pa., cost \$161,123, completed; new coal pier No. 18 at Jersey City, N. J., cost \$1,506,513 (1918 allowance \$800,000); storage yard, Port Newark, Newark, N. J., cost \$227,003, 92 per cent completed; renewal bridge No. 1 at Phillipsburg, N. J., cost \$475,642, 17 per cent completed; coal thawing sheds, Jersey City, cost \$252,380, 7 per cent completed; additional yard tracks, Allentown, Pa., cost \$279,556, 53 per cent completed; extension of service plant, Jersey City, cost \$188,902, 90 per cent completed; extension fifth track, Bayonne, N. J., to Jersey City, cost \$111,591, 5 per cent completed; storage yard pier No. 18, Jersey City, cost \$828,686, 48 per cent completed (1918 allowance, \$500,000).

Chartiers Southern

First Track: Clarksville, Pa., to near Jefferson, 3.50 miles.

Other Important Work Under Construction: Extension from Eighty-Four, Pa., to Marianna, 10.20 miles, work indefinitely postponed, cost \$1,385,000, 65 per cent completed; Champion to near Jefferson, 9 miles, cost \$1,912,840, 50 per cent completed; Crucible to Nemaquin mine, 5.50 miles, cost \$835,000, 10 per cent completed.

Chesapeake & Ohio

First Track: Extension Big Coal branch from Seth, W. Va., to Whitesville, 13.3 miles, branch line up Big Elk Run of Coal river, 3.8 miles; Marsh Fork extension, Little Marsh, W. Va., to Hozy Creek, 6.5 miles; branch up

Pond Fork from Madison, W. Va., 11.6 miles; branch Man, W. Va., up Huff creek of Guyandot river, 2.7 miles.

Second Track: Barboursville, W. Va., to Clover Valley, 1.44 miles; Peaks Mill to Peach creek, W. Va., 3.38 miles; West Hamlin to Salt Rock, W. Va., 2.08 miles; Logan, W. Va., to Stollings, 1.1 miles; Brems to Strathmore, 3.00 miles.

Other Important Work Under Construction: Eight-stall addition to roundhouse, Fulton, Va., cost \$109,136, completed; renewal of bridge over Coal river with double track structure, St. Albans, W. Va., cost \$151,485, completed; third track from Big Sandy Junction to Russell, Ky., 11.3 miles, cost \$490,000, 4 per cent completed; renewal bridge No. 44 with double track structure, Clover Valley, W. Va., cost \$153,516; extension of line from Man to Gilbert, W. Va., 13.0 miles, cost \$850,053, 71 per cent completed; new additional westbound yard, Russell, Ky., cost \$819,618, 70 per cent completed; renewal bridge No. 66, Martha, W. V., with double track structure, cost \$135,678, 50 per cent completed; water station at Silver Grove, Ky., cost \$131,000, 3 per cent completed; additional shop facilities, Huntington, W. Va., cost \$535,500, 50 per cent completed.

Chicago & Alton

Other Important Work Under Construction: Track elevation, Rockwell to Kedzie avenues, Chicago, cost \$275,793, 85 per cent completed (work held up); yards and tracks, Carlinville, Ill., cost \$144,971, 62 per cent completed; freight terminal, Chicago, cost \$1,400,000 (work held up).

Chicago & Eastern Illinois

Second Track: At Okaw, Ill., 0.33 mile; Jackson (Ind.) coal branch, 1.64 miles; total 1.97 miles.

Chicago & Erie

Other Important Work Under Construction: Freight station and yard, Webster avenue, Chicago, cost \$232,681, completed; addition to yards, Marion, O., cost \$445,641, completed.

Chicago & North Western

Other Important Work Under Construction: Ore docks and yards, Ashland, Wis., cost \$1,727,200, completed; elevator (6,000,000 bu.), South Chicago, Ill., cost \$4,583,348, completed; elevator (1,500,000 bu.) Council Bluffs, Ia., cost \$1,604,053, completed; extension of shop buildings, Chicago, cost \$721,054, completed; track elevation, Milwaukee, Wis., cost \$1,192,614, completed; addition to engine house, Nelson, Ill., cost \$182,000, completed; track elevation, Mayfair, Chicago, cost \$792,000, completed; reconstruction Des Plaines river bridge, Galena division, cost \$149,550, completed; Franklin-Orleans street viaduct, Chicago, cost \$709,340, completed; 20-stall addition to engine house, Fond du Lac, Wis., cost \$485,745, completed; Poposia mine spur, 3.77 miles, at Hudson, Wyo., cost \$139,020, completed.

Chicago, Burlington & Quincy

First Track: Cut-off on old line at Orin Junction, Wyo., 1.16 miles.

Second Track: At Smithboro, Ill., 0.18 mile; at Beardstown, 1.64 miles; at Girard, 0.22 mile; Keyesport to Shattuck, 10.43 miles; Smithboro to Durlay, 2.63 miles; at St. Joseph, Mo., 0.08 mile; Crawford, Neb., to Rutland, 5.95 miles; Ashland to Greenwood, 7.63 miles; Sheridan, Wyo., to Dietz, 3.70 miles; total 32.46 miles.

Chicago, Indianapolis & Louisville

Other Important Work Under Construction: Midland, Ind., yard and engine terminal (1918 appropriation \$38,500), cost \$230,282, 16 per cent completed.

Chicago, Milwaukee & St. Paul

First Track: Techny, Ill., to Bensenville, 3.7 miles.

Second Track: Techny, Ill., to Bensenville, 3.5 miles; Montevideo, Minn., to Milan, 5.6 miles; total 9.1 miles.

Other Important Work Under Construction: Track elevation, Milwaukee, Wis., cost \$2,083,444, completed; track depression, Minneapolis, cost \$1,365,261, completed; new station, Butte, Mont., cost \$272,945, completed; roundhouse, Sioux City, Ia., cost \$120,902, completed; electrification, Othello-Argo, cost \$8,990,741, to be completed by July, 1919; additions to shops, Dubuque, Ia., cost \$115,000, completed; engine terminal, Ottumwa Junction, Ia., cost \$772,300, completed; bridge over Missouri river, Chamberlain, S. Dak., cost \$210,200, completed.

Chicago, Rock Island & Pacific

Second Track: Allerton, Ia., to Clio, 7.6 miles; Tindall, Mo., to Trenton, 4.3 miles; Topeka, Kan., to Bishop, 6 miles; Paxico, Kan., to McFarland, 3.90 miles.

Other Important Work Under Construction: Track elevation, Chicago, cost \$144,780, 87 per cent completed; second main track; engine terminal, Burr Oak, Ill., cost \$246,935, 60 per cent completed.

Chicago Union Station

First Track: At Chicago, Ill., 0.70 mile.

Chicago, St. Paul, Minneapolis & Omaha

Other Important Work Under Construction: Engine terminal, St. Paul, Minn., cost \$108,563, completed.

Cincinnati, Indianapolis & Western

Other Important Work Under Construction: Coal branch from Dana, Ind., 5 miles, cost \$103,461, 90 per cent completed; track elevation, Indianapolis, Ind., cost \$100,000, 60 per cent completed; freight house and office building, Indianapolis, cost \$201,520, 90 per cent completed.

Cincinnati, New Orleans & Texas Pacific

First Track: In Tennessee, from M. P. 236.25 to 237.25, 2 miles.

Second Track: In Tennessee, M. P. 216.1 to 217.5, 1.40 miles; M. P. 215.3 to 215.4, 0.4 miles; M. P. 213.4 to 213.8, 0.40 miles; M. P. 229.2 to 230, 0.80 miles; M. P. 236.2 to 237.2, 1 mile; in Kentucky, from M. P. 124 to 132, and from M. P. 143.7 to 146.7, 9 miles; total 13 miles.

Other Important Work Under Construction: Reconstruction of Tennessee river bridge, Chattanooga, Tenn., cost \$268,175, completed; second track, Helenwood, Tenn., to Robbins, 6.00 miles, cost \$354,000; Huffman to Lansing, cost \$1,311,841.

Cleveland, Cincinnati, Chicago & St. Louis

Second Track: Union City, Ind., to Winchester, 9.00 miles; between Marion, Ohio, and Nelson, 33.00 miles; Ansonia to Union City, 9.00 miles; Columbus to Avenue, 4.60 miles; total 55.60 miles.

Other Important Work Under Construction: Additional yard facilities at Mattoon, Ill., cost \$115,000, grading completed; building 4.30 miles of first track near Zionsville, Ind., 10 per cent completed; building second track from Briar, Ind., to Beech Grove, 9 miles, 50 per cent completed, and from Augusta, Ind., to Whitestown, 11 miles, 10 per cent completed; separation of grades in Indianapolis, Ind., cost \$600,000, 75 per cent completed; new receiving yard at Brightwood, cost \$176,000, completed; additional yard facilities at Beech Grove, cost \$145,000, completed; rebuilding bridge No. 6 at Cleveland, Ohio, cost \$221,450, substructure completed, superstructure to be completed by March, 1919; separation of grades at four streets in Columbus, cost \$332,287, completed; additional yard facilities at Bellefontaine, cost \$270,000, and rearrangement of tracks, relocation of freight house and track connections at Bellefontaine, cost \$128,000, completed; additional yard facilities at Sharonville, cost \$545,000, to be completed by March, 1919; additional yard facilities at Columbus, cost \$265,000, grading completed; new engine terminal at Galion, cost \$219,000, and additional yard facilities at Galion, cost \$152,000, completed; extension of yard, Bellefontaine, O., cost \$135,000, completed; rearrangement of tracks at Galion, O., cost \$100,400, completed; engine terminal and yards at Ansonia, O., to cost \$184,800.

Colorado Railroad

First Track: M. P. 83 to Ingleside (Colo.) branch, 0.19 mile.

Columbia & Nehalem River

First Track: In Oregon, not specified, 1.00 mile.

Cumberland Valley

Second Track: Newville, Pa., to Oakville, 2.71 miles; Maugansville, Md., to Hagerstown, 1.93 miles; total 4.64 miles.

Other Important Work Under Construction: Extension of second track and revision of grade and alignment from Oakville, Pa., to Shippensburg, cost \$440,000, 35 per cent completed; additional yards at Cumbo, W. Va., to cost \$120,000, 65 per cent completed.

Delaware & Hudson

First Track: At Ninevah, N. Y., 0.24 mile.

Second Track: Windsor, N. Y., to Ninevah, 6.50 miles.

Third Track: Between Oneonta, N. Y., and Albany, 1.28 miles.

Other Important Work Under Construction: From Schenectady, N. Y., to Richmondville Summit, 12.45 miles main track, signals, bridges, etc., cost \$814,712, 45 per cent completed; \$450,000 of the appropriation was cancelled.

Delaware, Lackawanna & Western

Other Important Work Under Construction: Elimination of 26 grade crossings, Orange, N. J., cost \$2,173,165, 99 per cent completed; elimination of grade crossing and new passenger station, Madison, N. J., cost \$646,250, 98 per cent completed; grade crossing elimination, Passaic, N. J., cost \$197,631, 90 per cent completed; grade crossing elimination, East Buffalo, N. Y., cost \$284,776 completed; grade crossing elimination, Buffalo, N. Y., cost \$424,770, completed; engine terminal, Jersey City, N. J., cost \$148,174, completed; power plant, East Buffalo, cost \$284,646, completed; extension of piers No. 3 and No. 4, at Hoboken, N. J., cost \$146,835, 95 per cent completed; rebuilding power house, Hoboken, cost \$121,646, 35 per cent completed; additions to engine terminal Gravel Place, Pa., cost \$117,714, completed.

Denver & Rio Grande

First Track: Cokedale, Colo., to Bon Carbo, 7.19 miles; Hooper (Utah) branch to Kingsville and to Cox, 2.76 miles; total 9.95 miles.

Other Important Work Under Construction: Yard and engine terminal at Soldier Summit, Utah, cost \$850,000, 41 per cent completed; second track, Buttes, Colo.-Pueblo, cost \$103,435, 67 per cent completed.

Detroit Terminal

Second Track: In Michigan, at various points, 0.66 mile.

Duluth & Iron Range

Other Important Work Under Construction: Logging spur, 18 miles, from Wales, Minn., cost \$215,997, completed; repair shop, Two Harbors, Minn., cost \$192,854, completed.

Duluth, Missabe & Northern

Other Important Work Under Construction: Coal handling bridge, Duluth, Minn., cost \$239,750; steel and concrete ore dock, Duluth, cost \$3,839,714, 85 per cent completed; Missabe mine spur, cost \$177,399, completed; spur to Carson Lake and Fletcher mines, cost \$263,105, 95 per cent completed.

El Paso & Southwestern

Other Important Work Under Construction: Change of line, M. P. 117-144, Eastern division, cost \$514,063, completed.

Erie

Other Important Work Under Construction: New engine terminal, Croxton, N. J., cost \$875,695, completed; renewal of bridge No. 192.22, cost \$183,064, completed; coaling plant, Hornell, N. Y., cost \$255,000, completed; revision of engine terminal, East Buffalo, cost \$248,137, completed; elimination of grade crossing, Louisiana street, Buffalo, cost \$269,689, completed; engine terminal, Salamanca, N. Y., cost \$237,293, 90 per cent completed; elimination of grade crossings, Jamestown, N. Y., cost \$475,075, 40 per cent completed; engine terminal facilities, Brockwayville, Pa., cost \$142,445, 75 per cent completed; engine terminal, Avoca, Pa., cost \$260,000, 30 per cent completed; improved engine terminal, Ferrona, Pa., cost \$201,552, completed; engine terminal facilities, Meadville, Pa., cost \$415,081; classification yard, Girard, O., cost \$169,643, completed; elimination of grade crossing, P. R. R. and Liberty road, Girard, cost \$150,000, 20 per cent completed; improved freight handling facilities, Akron, O., cost \$241,061, 95 per cent completed; separation of grades, Youngstown, O., cost \$147,840, 70 per cent completed; enlarging the yard at Kenmore, O., cost \$113,583, completed; engine terminal facilities, Dayton, O., cost \$245,703, completed.

Franklin & Abbeville

First Track: Prevost Spur (La.), 3.00 miles.

Galesburg, Rockford & Northern

Other Important Work Under Construction: Building extension from Hoopole, Ill., to Geneseo, 16 miles, work includes two 100 ft. bridges, cost \$325,000, 5 per cent completed.

Galveston, Harrisburg & San Antonio

First Track: Rosenberg, Tex., to Damon Mound, 22.00 miles.

Second Track: Ysleta, Tex., to El Paso, 12.49 miles; San Antonio to Withers, 6.47 miles; total 18.96 miles.

Other Important Work Under Construction: Galveston (Tex.) Causeway, (G., H. & S. A. share), \$207,280, expected to be completed by June, 1920.

Grand Trunk Western

Other Important Work Under Construction: Yard extension, Nichols, Mich., cost \$406,000, to be completed June, 1919; car shops, Port Huron, cost \$473,000, completed.

Great Northern

Second Track: Long Lake, Minn., to Delano, 11.56 miles; Kandiyohi to Pennock, 11.02 miles; Campbell to Breckenridge, 15.31 miles; Cut Bank, Mont., to Blackfoot, 25.33 miles; total 63.22 miles.

Third Track: At Minneapolis, Minn., 4.26 miles.

Fourth Track: At Minneapolis, Minn., 4.25 miles.

Other Important Work Under Construction: Ward street bridge, Minot, N. D., cost \$135,391, 90 per cent completed; water supply, at Bowdoin, Mont., cost \$162,980, 97 per cent completed; engine house, etc., Bowdoin, cost \$276,675, completed; ore dock, Allouez, Wis., cost \$748,682, completed; freight house, team tracks, etc., St. Paul, cost \$1,832,771, 90 per cent completed; yard extension, Minot, N. D., cost \$125,000, completed; rebuilding snow sheds, Tye, Wash., to Scenic, cost \$170,000, completed; lining two tunnels, Butte division, cost \$185,000, 90 per cent completed; new material yard (Minneapolis Belt Line), Northtown, Minn., cost \$927,762, completed.

Gulf & Ship Island

Other Important Work Under Construction: Spur track extension 34.5 miles, Hovey, Miss., to Kiln, cost \$260,000, 80 per cent completed.

Gulf, Colorado & Santa Fe

Second Track: At Galveston, Texas, 2.00 miles.

Other Important Work Under Construction: Galveston Causeway (G. C. & S. F. share), \$305,151, 50 per cent completed; reconstruction of Gulf & Interstate Railway from Port Bolivar, Tex., to High Island, cost \$172,810, completed.

Gulf, Florida & Alabama

First Track: Pensacola, Fla., to Navy Yard, 5.08 miles.

Gulf, Mobile & Northern

First Track: McLain, Miss., to end of track, 30.00 miles; Middleton, Tenn., to Barrett's Divide, 18.00 miles; total 48.00 miles.

Other Important Work Under Construction: Extension of Blodgett branch, McLain, Miss., north, to be 31 miles long; total cost \$560,000, 92 per cent completed; extension of Middletown-Jackson line, to be 40 miles long, 80 per cent completed.

Hocking Valley

Second Track: Delaware, Ohio, to Marion, 6.90 miles; Marion to Walbridge, 6.00 miles; total 12.90 miles.

Other Important Work Under Construction: Passing track between Marion, Ohio, and Pemberville (to be absorbed later as second track), cost \$443,000, 70 per cent completed; additional yard tracks at Walbridge, O., cost \$394,740, and at Columbus, cost \$128,000, completed; grade crossing elimination at Columbus, cost \$224,331, completed; fuel and water stations at Walbridge, Carey, Columbus, Logan, and Nelsonville, O., cost \$367,659, completed; ten-stall engine house, turntable, shops and tracks at Nelsonville, O., cost \$120,000, completed.

Houston & Texas Central

Other Important Work Under Construction: 12-mile belt line around Dallas, Tex., cost \$834,500.

Illinois Central

Second Track: Belleville, Ill., to Wilderman, 2.8 miles.

Third Track: From Du Quoin, Ill., to Bois, 3 miles.

Fifth Track: Chicago, Twenty-second to Fortieth street, 5 miles, and Kensington to Riverdale, 4 miles.

Sixth Track: Chicago, Twenty-second to Fortieth street, 5 miles, and Kensington to Riverdale, 4 miles.

Other Important Work Under Construction: Branch from Golconda, Ill., 6.5 miles, cost \$125,000, 40 per cent completed; Chicago, reconstruction of bridges from Sixty-third to Sixty-seventh streets, inclusive, cost \$537,000, 94 per cent completed, and Fifty-first to Sixtieth streets, inclusive, cost \$821,850, 50 per cent completed; raising tracks between Fifty-first and Sixty-seventh streets, cost \$426,800, to be completed by June, 1919; building suburban stations at Sixty-third, Sixty-fourth, Sixty-sixth and Sixty-seventh streets, cost \$302,270, completed; depot and office building Sixty-third street, cost \$878,000, completed; reconstruction St. Charles Air Line bridge, cost \$151,420, 80 per cent completed; classification yard, cost \$1,500,000; track elevation from Grand Crossing to Kingston, cost \$2,082,300, 31 per cent completed; engine terminal at Hawthorne, cost \$150,890, 75 per cent completed; four track bridge over Kankakee river, Kankakee, Ill., cost \$346,357, 71 per cent completed, and engine terminal, cost \$136,476, completed; engine terminal and additional yard tracks, Champaign, cost \$259,000, completed; additional yard tracks, Centralia, cost \$171,710, 85 per cent completed; water supply, Du Quoin, Ill., cost \$100,000, 10 per cent completed; engine terminal, Carbondale, cost \$300,000, completed; engine terminal and yard tracks, Mounds, cost \$458,000, 95 per cent completed; inbound freight house, East St. Louis, cost \$142,810, and engine terminal and additional yard tracks, East St. Louis, cost \$130,290, completed; engine terminal, Clinton, cost \$200,949, completed; engine terminal and yard at Amboy, cost \$316,170, completed; passenger station, Mattoon, cost \$107,715, and engine terminal, cost \$116,530, completed; renewal of bridges on system, cost \$1,715,340, to be completed by December, 1919; change in line and additional yard tracks, Stithton, Ky., cost \$128,300, completed; engine terminal at Paducah, Ky., cost \$265,000, completed; change of grade and line 13.5 miles from Princeton, Ky., to Dawson, cost \$802,000, 58 per cent completed; engine terminal, Fulton, Ky., cost \$190,000, completed; grade separation at East Junction, Memphis, Tenn., cost \$161,160, and additional trackage Nonconah yard, Memphis, cost \$328,920, nearing completion.

Indianapolis Union Railway

Other Important Work Under Construction: Elevation of Union tracks at Indianapolis, Ind., cost \$3,060,000, 25 per cent completed.

International & Great Northern

Other Important Work Under Construction: New shop buildings, San Antonio, Tex., cost \$229,163, completed.

Jacksonville Terminal Company

Other Important Work Under Construction: Reconstruction and enlargement of passenger and freight facilities at Jacksonville, Fla., cost about \$2,500,000, to be completed in 1919.

Kanawha & Michigan

First Track: Gauley Bridge, W. Va., to Belva, 5.60 miles.

Other Important Work Under Construction: Local freight station, Charlestown, W. Va., cost \$175,000, completed; storage yard, Dunbar, W. Va., cost \$100,000, 90 per cent completed; extension Hobson, O., to Meigs, 5.5 miles, cost \$431,725, 10 per cent completed; extension from West Charleston, W. Va., to Dunbar, 3.90 miles, cost \$100,000, 25 per cent completed.

Kansas City Southern

First Track: Kansas City, Mo., 1.01 miles.

Second Track: Kansas City, Mo., 1.01 miles.

Kentucky & Indiana Terminal Railroad

Other Important Work Under Construction: Engine terminal, including 3.30 miles of terminal yard track at Louisville, Ky., cost \$350,000, completed, and concrete coaling station to cost \$100,000, 10 per cent completed.

Klamath Falls Municipal

First Track: Klamath Falls, Ore., to Dairy, 6.00 miles.

Lake Erie & Western

Other Important Work Under Construction: Roundhouse, Lima, O., cost \$250,000, 30 per cent completed.

Lake Erie, Franklin & Clarion

First Track: Reidsburg Junction, Pa., to Alsace, 3.00 miles.

Lake Superior & Ishpeming

Other Important Work Under Construction: Shops and engine terminal at Presque Isle, Marquette, Mich., to include 20-stall roundhouse and other structures also about four miles terminal tracks, cost \$430,000, 75 per cent completed.

Lancaster & Chester

Other Important Work Under Construction: Bridge renewal work on Catawba river in South Carolina, cost \$125,000, completed.

Lehigh & New England

First Track: Bethlehem, Pa., to Allentown, 3.00 miles.

Lehigh Valley

Third Track: Manchester, N. Y., to Farmington, 3.75 miles.

Other Important Work Under Construction: Renewal of bridges, No. 269, Athens, Pa., cost \$248,560; No. 407, Stafford, Pa., cost \$146,000; No. 386, Wadsworth, N. Y., cost \$266,000; No. 379a, Rochester Junction, N. Y., cost \$109,700, and No. 341b, Geneva Junction, N. Y., cost \$138,517; all completed; engine terminal and tracks, Ashmore, Pa., cost \$1,200,000, to be completed in January, 1919; new boiler house, Perth Amboy, N. J., cost \$196,164, completed; Hamburg Turnpike viaduct, Buffalo, N. Y., cost \$216,013, 83 per cent completed; Avenue R, bridge, Newark, N. J., cost \$193,135, completed; engine terminal, East Buffalo, N. Y., cost \$688,710,

completed; Tift Farm engine terminal, Buffalo, cost \$509,687, completed; engine terminal, Suspension Bridge, cost \$431,107, completed; engine terminal, Manchester, cost \$684,458, completed; new pier and bulkhead pier 44 East River, New York, cost \$142,010, completed; changes on piers D. H. and L at Jersey City, N. J., cost \$240,360, completed.

Live Oak, Perry & Gulf

First Track: Enconfina (Fla.), river west 4.00 miles.

Second Track: Altav, Fla., to main line, 1.75 miles.

Other Important Work Under Construction: Extension from Enconfina (Fla.), river west 10 miles, of which 7 miles are under construction.

Long Island

First Track: At Bethpage Junction, N. Y., 0.02 mile.

Second Track: Floral Park, N. Y., to Garden City, 3.11 miles; Hempstead to Meadow Brook, 1.84 miles; Hicksville to Pinelawn, 6.45 miles; total 11.40 miles.

Other Important Work Under Construction: Yard changes, Long Island City, N. Y., cost \$140,930, completed; terminal facilities at Camp Upton, cost \$250,000, completed; improved engine house facilities, Long Island City, cost \$104,440, 70 per cent completed; improvements, including classification yard, Bay Ridge, cost \$262,227, 70 per cent completed; freight yard at Bushwick, cost \$247,230, 90 per cent completed; rearrangement and new station and track at Rockaway Park, cost \$127,892, completed.

Louisville & Nashville

First Track: Kildav, Ky., to Seagrove, 9.58 miles; Grays Knob to mouth of Turtle Creek, 2.70 miles.

Other Important Work Under Construction: Bulkheads and bank protection, Pascagoula, Miss., cost \$123,464, 82 per cent completed; second track 7.55 miles from Corbin, Ky., to Arkle, cost \$252,502, 40 per cent completed; terminal yard at De Courcy, Ky., cost \$1,356,471, completed; extension of yard at Montgomery, Ala., cost \$276,200, 44 per cent completed; yard facilities at Radnor, Tenn., cost \$2,170,067, 89 per cent completed; Lexington & Eastern branch from Blackey, Ky., 3.5 miles, cost \$150,000, 60 per cent completed, and from Hamdin, Ky., 6.68 miles, \$230,000, 42 per cent completed; branches in Perry county, Ky., 7.91 miles, cost \$229,099, 75 per cent completed; Kentucky & Virginia, spur from Evans, Ky., 6 miles, cost \$210,000, 36 per cent completed; reconstruction of coal wharf, Mobile, Ala., cost \$114,251, 78 per cent completed.

Madison, Illinois & St. Louis

Other Important Work Under Construction: Engine terminal in north end of Madison yard in Venice, Ill., cost \$140,000, 30 per cent completed.

Mahoning Coal Road

Other Important Work Under Construction: Coalburg, O., enlargement of yard, cost \$402,451, completed; additional car repair tracks, cost \$110,000, 10 per cent completed, and new engine terminal, cost \$675,000, 30 per cent completed; Hunrod avenue viaduct, Youngstown, O., cost \$310,285, 31 per cent completed.

Maine Central

First Track: Fairfield, Me., to Benton, 0.71 mile.

Second Track: Waterville, Me., to Clinton, 7.47 miles.

Other Important Work Under Construction: Shop improvements, Waterville, Me., cost \$247,625, completed; renewal of bridge, Gardner, cost \$120,000; terminal improvements at Mattawamkeag, cost \$145,000, to be completed by June, 1919.

Marion & Eastern

First Track: Pittsburg, Ill., eastward, 1.00 mile.

Miami Mineral Belt

First Track: Hockerville, Kan., to Baxter Junction, 2.20 miles; Monarch to Naylor, 1.40 miles; total 3.60 miles.

Michigan Central

Other Important Work Under Construction: Engine terminal and yard, Niles, Mich., cost \$1,378,500, to be completed July, 1919; draw bridge, River Rouge, Detroit, Mich., cost \$541,000, to be completed July, 1920; boiler and tank shop, Jackson, Mich., cost \$355,000, to be completed March, 1919; steel car repair shop, West Detroit, Mich., cost \$210,000, completed; new roundhouse and facilities, Joliet, Ill., cost \$161,600, to be completed March, 1919.

Midland & Northwestern

First Track: Flory, Tex., to Seminole, 17.00 miles.

Minneapolis, St. Paul & Sault Ste. Marie

Other Important Work Under Construction: Concrete arch bridge, Frogner, Minn., cost \$133,800, 38 per cent completed.

Missouri, Kansas & Texas

Other Important Work Under Construction: Rearranging and enlarging yard and locomotive facilities at New Franklin, Mo., cost \$150,000, completed; building terminal and water supply at Appleton City, Mo., cost \$300,000, 20 per cent completed; building subway to carry Main street under tracks, Parsons, Kan., cost \$150,000, 65 per cent completed; rearranging and enlarging freight yard and building a reclamation plant at Parsons, cost \$350,000, completed; enlarging and rearranging locomotive facilities and yard at Fort Worth, Tex., cost \$300,000, 10 per cent completed; grade separation to eliminate street crossings, Dallas, Tex., cost \$360,342, 85 per cent completed.

Missouri Pacific

Other Important Work Under Construction: Track elevation, Omaha, Neb., cost \$198,500, completed.

Monongahela Railroad

Second Track: South Brownsville, Pa., to Luzerne, 4.61 miles.

Other Important Work Under Construction: Terminal improvements at

Brownsville, Pa., cost \$667,200, 32 per cent completed; additional yard tracks, Big Meadow Run, Pa., cost \$159,600, completed; second track from Big Meadow Run to Rush Rue, cost \$120,000, 60 per cent completed, and from Masontown, Pa., to Antram, cost \$171,000, to be completed March, 1919; shops at South Brownsville, Pa., cost \$105,000, 4 per cent completed; additional side tracks at Big Meadow Run, Pa., cost \$216,000, 45 per cent completed.

Morgan's Louisiana & Texas

Other Important Work Under Construction: New machine shops, Algiers, La., cost \$152,800, completed.

Morgantown & Wheeling

First Track: Between state line and Brave, Pa., 2.20 miles; between Blacksville, W. Va., and state line, 1.50 miles; total 3.70 miles.

Nashville, Chattanooga & St. Louis

First Track: Cravens, Tenn., to Alton Park; Coalmont, Tenn. to Tatesville.

Other Important Work Under Construction: Grade reduction, Chattanooga division, M. P., 76.84, cost \$272,740, nearing completion; engine terminal, Atlanta, Pa., cost \$206,796, 6 per cent completed; connecting track, Radnor, Tenn., 4.33 miles, cost \$963,177, 20 per cent completed; freight house and team tracks, Cleveland, O., cost \$129,544, completed; grade crossing elimination at Cleveland, O., to cost \$2,136,000, to be completed June, 1920; yard extension at Bellevue, O., cost \$133,787, completed.

New York Central

First Track: At Grand Central Terminal, New York, 1.56 miles; extension of New Jersey Junction, West New York, N. J., 0.17 mile.

Second Track: Through Lyons, N. Y., yard, 1.03 miles.

Third Track: Through Poughkeepsie, N. Y., 1.63 miles; Dunkirk, N. Y., 1.82 miles.

Fourth Track: Through Poughkeepsie, N. Y., 1.10 miles; Dunkirk, N. Y., 0.60 mile; Granton, N. J., to Little Ferry, 1.50 miles; Perry, Ohio, to Painesville, 6.42 miles.

Other Important Work Under Construction: Syracuse, N. Y., Solvay engine house, cost \$900,000, 2 per cent completed; new engine terminal, Watertown, N. Y., cost \$900,000, 15 per cent completed; additions and extensions to engine house at Clearfield, Pa., cost \$120,000, 85 per cent completed; additional eastbound yard at Minoa, N. Y., cost \$250,000, 28 per cent completed; third and fourth track, Syracuse Junction branch, Syracuse, N. Y., cost \$460,000, 44 per cent completed; engine house extension and alterations, Minoa, N. Y., cost \$204,000, 47 per cent completed; additions to engine house facilities at Cherry Tree, Pa., cost \$150,000, 75 per cent completed; extension of car repair shop, East Buffalo, N. Y., cost \$550,000, 3.1 per cent completed; engine house improvements, De Witt, N. Y., cost \$250,000, 40 per cent completed; engine terminal and yard tracks, Genesee Junction, N. Y., cost \$214,000, 16 per cent completed; freight repairs shop facilities, New Durham, N. J., cost \$200,000, 3 per cent completed; additional shop facilities, Avis, Pa., cost \$855,000, 12 per cent completed; addition to Massey street yard, Watertown, N. Y., cost \$120,000, 25 per cent completed; Piers K4 and K5, Weehawken, N. J., cost \$1,564,000, 3 per cent completed; reconstruction 149th street bridge, New York, cost \$284,700, 24 per cent completed; elimination of yard crossings at Dutchess Junction, N. Y., cost \$424,813, completed; reconstruction of bridge No. 698C, at Rochester, N. Y., cost \$128,450, 17 per cent completed; elimination of grade crossing, Hertel avenue, Buffalo, N. Y., cost \$400,390, 71 per cent completed; new yard at West Albany, N. Y., cost \$546,107, 40 per cent completed; general improvements, Utica, N. Y., cost \$509,940, 15 per cent completed; yard extension, Little Ferry, N. J., cost \$313,535, 33 per cent completed; passenger station facilities, Poughkeepsie, N. Y., cost \$329,037, completed; express building, Buffalo, N. Y., cost \$742,318, 97.5 per cent completed; ice house and repair yard, Weehawken, N. J., cost \$397,192, 45 per cent completed; new freight house and team yard, West Lockport, N. Y., cost \$106,878, completed; new engine house facilities, Belle Isle, N. Y., cost \$784,153, 94 per cent completed; engine terminal and yard improvements, Gardenville, N. Y., cost \$2,264,800, 83 per cent completed; change of alignment, Tonawanda, N. Y., cost \$1,849,092, 14.5 per cent completed; improvements, Grand Central terminal, New York, cost \$3,701,530, 72 per cent completed; new trackage at Norwood, N. Y., cost \$151,000, work delayed; third and fourth track improvements at Dunkirk, N. Y., cost \$174,900, 96 per cent completed; terminal improvements, Erie and Wesleyville, cost \$221,847, 96 per cent completed; grade separation, Erie, Pa., cost \$139,985, 50 per cent completed; new west bound yard, Dock Junction, Pa., cost \$541,612, 70 per cent completed; new west bound freight main and yard tracks, Perry to Painesville, O., cost \$204,328, 71 per cent completed; water supply improvements at Nottingham, O., cost \$109,730, completed; extension to locomotive shops, Collinwood, O., cost \$350,000, 20 per cent; East One Hundred and Fifth street subway, Cleveland, O., cost \$125,243, completed; new freight terminal, Cleveland, O., to cost \$4,513,000, nearing completion; additions to Kinsman Road yard, Cleveland, O., cost \$140,000, 45 per cent completed; additions to yard, Marcy, O., cost \$100,000, 45 per cent completed; new yard, Rockford, O., cost \$960,885, 65 per cent completed; grade separation, Elyria, O., cost \$354,595, 30 per cent completed; new yard and engine terminal, Minerva, O., cost \$500,000, 45 per cent completed; engine terminal and additional yard facilities, River Rouge, Mich., cost \$173,896, completed; grade separation, Detroit, Mich., cost \$267,589, 85 per cent completed; Russell street freight house and team tracks, Detroit, Mich., cost \$341,442, completed; yard extension at Elkhart, Ind., cost \$279,000, 80 per cent completed.

New York, New Haven & Hartford

First Track: Casanova, N. Y., to connection with New York Connecting 0.08 mile.

Second Track: Casanova, N. Y., to New York Connecting 0.06 mile.

Third Track: Casanova, N. Y., to New York Connecting 0.08 mile; South Bay Junction, Mass., to Boston freight terminal, 0.50 mile; total 0.58 mile.

Fourth Track: Casanova, N. Y., to New York Connecting 0.06 mile; South Bay Junction, Mass., to Boston freight terminal, 0.50 mile; total 0.56 mile.

Fifth Track: Belle Dock Junction, Conn., to Quinnipiack, 1.00 mile.

Sixth Track: Belle Dock Junction, Conn., to Quinnipiack, 1.00 mile.

Other Important Work Under Construction: Strengthening bridge, Waterbury, Conn., cost \$118,171, completed; rebuilding bridge, Hartford, Conn., cost \$370,090, completed; Thames river bridge, New London, Conn., cost \$2,740,000, 84 per cent completed; rebuilding bridge, Mystic, Conn., cost \$211,131, 91 per cent completed; enlargement of South Boston cut for four tracks, Boston, Mass., cost \$972,000, 84 per cent completed; freight classification yard and engine facilities, Cedar Hill, Conn., cost \$234,200, 50 per cent completed; additional yard tracks, Waterbury, Conn., cost \$184,100, 86 per cent completed; extra classification yard, Midway, Conn., cost \$217,000, completed; freight terminal and classification yard, Boston, Mass., cost \$1,697,000, 11 per cent completed; classification yard and engine facilities, Pawtucket, R. I., cost \$1,403,780, 30 per cent completed; additional side tracks, Springfield, Mass., cost \$170,000, 80 per cent completed; connecting track from Highland branch yard to Naugatuck line, Waterbury, Conn., cost \$340,000, 7 per cent completed; additional yard tracks, Hartford, Conn., cost \$223,000, 5 per cent completed; passenger station, New Haven, Conn., cost \$1,434,713, 54 per cent completed; improvements at coaling plant pier No. 4, Boston, Mass., cost \$113,491, completed; engine house and terminal facilities, Danbury, Conn., cost \$204,895, completed; new and enlarged engine house facilities, Boston, Mass., cost \$762,822, completed; Cedar Hill engine terminal, New Haven, Conn., cost \$181,500, 24 per cent completed; engine facilities, South Worcester, Mass., cost \$157,240, 70 per cent completed; four coal towers, East Providence, R. I., cost \$184,636, completed.

New York, Susquehanna & Western

Other Important Work Under Construction: Additional tracks and warming house, Undercliff, N. J., cost \$212,000 completed; additional engine terminal facilities, Little Ferry, N. J., cost \$101,623, completed.

Norfolk & Portsmouth Belt

First Track: From connection with Virginian Railway in Virginia to Elizabeth River, 2.47 miles.

Norfolk & Western

First Track: Putnam, Va., to end of line, 8.91 miles; in West Virginia, extensions of Western branch, 0.25 mile and of Alma branch 0.96 mile; total 10.12 miles.

Other Important Work Under Construction: Coal handling machinery pier No. 3, Lamberts Point, Va., cost \$400,000, 50 per cent completed; reinforced concrete viaduct, Lynchburg, Va., cost \$205,000, completed; freight station, Roanoke, Va., cost \$380,000, completed, and increased engine terminal and yard facilities, cost \$1,710,000, 10 per cent completed; additional tracks, Shenandoah, Va., cost \$154,000, completed; additional yard tracks, Hagerstown, Md., cost \$600,000, 3 per cent completed; third track from Pelton, Va., to Vicker, 2.80 miles, cost \$240,000, 58 per cent completed, coal and water station, Vicker, Va., cost \$140,000, 98 per cent completed; additional yard facilities, Bristol, Va., cost \$700,000, 88 per cent completed; additional storage tracks, Bannock, O., cost \$100,000, 70 per cent completed; station building, Camp Lee, Petersburg, Va., cost \$200,000, completed; freight station, Winston-Salem, N. C., cost \$167,000, completed.

New York Connecting Railroad

First Track: Sunnyside Junction, N. Y., to Fresh Pond, 4.32 miles.

Second Track: Sunnyside Junction, N. Y., to Fresh Pond, 4.32 miles.

Third Track: North right of way line of N. Y., N. H. & H., to Woodside avenue, N. Y., 3.73 miles.

Fourth Track: North right of way line of N. Y., N. H. & H., to Woodside avenue, N. Y., 3.73 miles.

Northern Pacific

Second Track: Jamestown, N. D., to Eldridge, 4.36 miles; Bozeman, Mont., to Logan, 32.38 miles.

Third Track: Billings, Mont., 1.07 miles.

Fourth Track: Billings, Mont., 1.16 miles.

Other Important Work Under Construction: Yellowstone division, construction dyke work and rip rap along Yellowstone river and similar work in Montana division; cost, \$218,707, 95 per cent completed; second track from Jamestown, N. D., to Windsor, 12 miles, cost \$328,937, 77 per cent completed; second track, Laurel, Mont., to Park City, 7.47 miles, \$145,197, 44 per cent completed; Kission, Mont., to Livingston, 5.6 miles, cost \$118,486, 38 per cent completed; rehabilitating and improving to main line standards on Pasco, Sunnyside and other branches in Washington, cost \$559,361, completed.

North Texas & Santa Fe

First Track: In Texas, not specified, 0.70 mile.

Oregon Short Line

First Track: Menan, Idaho, to Annis, 2.72 miles; Keefer to Thomas, 4.54 miles; Lincoln to Ammon, 3.58 miles; Garland, Utah, to Bear River City, 9.57 miles; Baker to Urban, 3.80 miles; total 24.21 miles.

Other Important Work Under Construction: Replacing 50-span pile trestle with steel spans and concrete piers and abutments at bridge 20-A, near Burley, Ida., cost \$200,996, nearing completion; Teton Valley branch, near Tetonia, Ida., to Brown Bear coal mines, construction 9.05 miles branch road, with 2.00 miles of siding, cost \$289,897, 15 per cent completed.

Oregon-Washington Railroad & Navigation Company

First Track: Primo, Wash., to Vesta Creek, 3.21 miles. Between Pine Creek and Masonia, 2.32 miles.

Second Track: Hanlons, Wash., to Kamela, 2.30 miles.

Other Important Work Under Construction: New line from Pine Creek, to Masponia, Ida., 10.54 miles, cost \$380,000; work deferred, filling trestle, L-2, St. John Junction, Ore., cost \$119,088. Completed; grade revision through Sullivan Gulch, Portland, Ore., cost \$488,187, 95 per cent completed; change in line, Alto, Wash., 5,070 feet, cost \$177,018, 95 per cent completed; dredging and construction of wharf and warehouse, Seattle, Wash., cost \$354,080. Completed.

Pennsylvania Railroad

First Track: Cairnbrook, Pa., southward 1.86 miles; Meadows Yard, N. J., 0.31 mile; connection with the Waverly Passaic branch, 0.46 mile; branch on the Meadows, 1.33 miles; at Princeton, N. J., 0.35 mile; at Trenton, 0.33 mile; West Morrisville, Pa., 0.08 mile; Petty Island branch, 2.22 miles; South Philadelphia, 1.06 miles; Manayunk, Pa., 0.63 mile; Coatsville branch, 2.03 miles; Unity branch extension, 2.42 miles; Turtle Creek branch extension, 4.78 miles; Ten-mile Run branch, 0.24 mile; Sixtieth street branch, Philadelphia, Pa., 4.51 miles; Girard Point to Essington, 6.51 miles; Essington to Chester, 1.48 miles; at Ridley river, 0.49 mile; at Darby river, 0.40 mile; at Stoney Creek yard, 0.35 mile; Camden, N. J., 1.98 miles.

Second Track: Mt. Holly, Birmingham, N. J., 4.81 miles; second track and change of line, Brownsville Junction to Linn, Pa., 2.46 miles; change of line and grade and second track, Bullis Mill, N. Y., to Eldred, Pa., 7 miles; grade revision and second track, Corry, Pa., to Brownell, N. Y., 5.50 miles; Glynden, Pa., to Spartansburg, 3.50 miles; Fifty-ninth street, Philadelphia, Pa., to Grays Ferry, 1.75 miles; at Peach Bottom, Md., 2.22 miles; at Meadows, N. J., 0.29 miles; at Princeton, N. J., 0.31 mile; at Trenton, 0.33 mile; at West Morrisville, Pa., yard, 1.90 miles; Petty Island branch 0.25 mile; Chelton avenue, Pa., 0.21 mile; at South Philadelphia, 1.06 miles; Manayunk, 0.63 mile; Saltsburg, 0.49 mile; Ten-mile Run branch, 0.38 mile; Sixtieth street, Philadelphia, 2.54 miles; Girard Point and Essington, 5.48 miles; Essington to Chester, 1.41 miles; South Chester branch, 0.04 mile; Marcus Hook, 0.34 mile.

Third Track: At Elkton, Md., 1.5 miles; Bayview yard, Md., 1.33 miles; Meadows yard, N. J., 0.26 miles.

Fourth Track: Newark, Del., to Elkton, Md., 2.53 miles; at Beacon Hill, Md., 1.74 miles; at Meadows Yard, N. J., 0.21 mile; Winans, Md., to S. Y. Tower; South Duquesne, Pa., to Drakesburg.

Fifth Track: Marcus Hook to Claymont, Pa.; at Philadelphia, 0.44 mile; at Torresdale, Pa., 0.20 mile; Parkersburg to Pomeroy, 1.10 miles.

Sixth Track: Edgely, Pa., to Tullytown, 0.73 miles; Philadelphia, Pa., 0.71 mile.

Other Important Work Under Construction: Car repair yard facilities, Greenville, N. J., cost \$256,770, completed; additional yard tracks, Sunnyside yard, Long Island City, cost \$458,598, 60 per cent completed; new yard tracks, Metuchen, N. J., cost \$145,324, 42 per cent completed; protecting center pier of Passaic river bridge, Newark, N. J., cost \$184,300, completed; changes at passenger station, New York, cost \$436,483, completed; facilities at U. S. Cantonment, Wrightstown, N. J., cost \$229,000, completed; Steelton, Pa., yard facilities, cost \$225,686, and freight station and car load delivery tracks, cost \$119,940, both completed; tank and caboose shop at Altoona, Pa., cost \$216,994, completed; extension to power plant, cost \$1,354,752, and extension to Juniata shop buildings at Altoona, Pa., cost \$748,750, under way; oil mixing and storing plant, South Altoona, Pa., cost \$184,267, completed; renewal of two bridges, Orrton, Pa., cost \$373,716, completed; reconstruction of bridge No. 57-99, Reading, Pa., cost \$316,196, 65 per cent completed; side track, Bolivar, Pa., cost \$176,162, completed; rebuilding freight facilities, Connelville, Pa., cost \$201,657, completed; additional classification tracks, Conemaugh, Pa., cost \$176,645, completed; new engine facilities, Derry, Pa., cost \$124,705, 25 per cent completed; improved freight facilities, East Liberty, Pa., cost \$565,811, and at Greensburg, Pa., cost \$101,051, both completed; extension of yard tracks, Pitcairn, Pa., cost \$104,502, 50 per cent completed, engine and storehouse facilities, Pitcairn, Pa., cost \$100,018, completed; coaling station, Pitcairn, Pa., cost \$150,000, completed; improved engine facilities, Youngwood, Pa., cost \$323,262, 95 per cent completed; locomotive terminal facilities, West Brownsville Junction, Pa., cost \$245,913, 95 per cent completed; grade crossing elimination, Buffalo, N. Y., cost \$184,648, 73 per cent completed; additional freight facilities, Buffalo, N. Y., cost \$741,764, 85 per cent completed; ore dock facilities and track changes at Buffalo, N. Y., cost \$123,046, completed; grade crossing elimination, Mineral Springs road, Buffalo, cost \$283,237; Shocks Mills freight storage yard, Marietta, Pa., cost \$467,905, completed; change of line and grade, Larabee, Pa., cost \$192,171, 98 per cent completed; elevating existing main track and grading for second track at Brownell to Sherman, N. Y., cost \$312,036, 58 per cent completed; additional engine house facilities, South Oil City, Pa., cost \$126,385, 98 per cent completed; elimination of grade crossings and rearrangement of freight facilities, Erie, Pa., cost \$142,107, 90 per cent completed; engine house and facilities, Kane, Pa., cost \$194,084, 90 per cent completed; extension to engine house, additional ash pits, oil house, etc., Renovo, Pa., cost \$103,450, 85 per cent completed; bridge at Lewistown Junction, Pa., cost \$135,300, completed; bridge at Nanticoke river, Pa., cost \$114,000, completed; new receiving yard and shipping tracks, Farnhurst, Del., cost \$132,769, completed; extension of second track, from Harrington, Del. to Greenwood, cost \$376,755, 95 per cent completed; extension to engine house, Philadelphia, Pa., cost \$120,607, 80 per cent completed; relocating freight station and tracks at Roberts avenue and King street, Philadelphia, cost \$140,074, completed; storage yard, Twenty-second street and Margie street, Philadelphia, cost \$160,793, completed; replacing bridge at Kensington avenue, cost \$153,299, and at Second street, on main line, Philadelphia, cost \$126,113, both completed; new line, Saltsburg, Pa., to Turtle Creek branch, 8.4 miles, cost \$769,746, 60 per cent completed; removing 1,000 ft. of cover at west end of Radebaugh tunnel, cost \$518,231, 4 per cent completed; partial development of new classification yard at west end, Sharpsburg, Pa., cost \$1,431,876, 62 per cent completed; 10-mile branch to Waynesburg, Pa., cost \$402,884, 60 per cent completed; 10-mile branch to Pitt Gas Coal Co., at Besco, Pa., cost \$140,466, 60 per cent completed; engine house facilities, additional yard tracks and shop appurtenances, Blairsville, Pa., cost \$219,556, 65 per cent completed; removing old tunnel lining 200 ft. at Radebaugh, Pa., cost \$132,415, completed; new engine facilities, Gardenville, N. Y., cost \$1,023,106, 75 per cent completed; new bridge over Red Bank creek, Red Bank, Pa., cost \$234,400, 75 per cent completed; bridge over Clarion river, Parkers Landing, Pa., cost \$289,657, 73 per cent completed; bridge over East Sandy creek, East Sandy, Pa., cost \$226,820, 73 per cent completed; bridge over Mahoning creek, Mahoning, Pa., cost \$213,163, 75 per cent completed; replacing engine house,

extending machine shop and other repair facilities, Pitcairn, Pa., to cost \$310,000, 84 per cent completed; change of line and grade, Freeport, Pa., to Butler Junction, Pa., cost \$1,072,017, completed; additional engine house facilities at Shire Oaks, Pa., cost \$142,986, 70 per cent completed. Rebuilding bridge at Schuylkill river, Ridgewood, Pa., cost \$275,254, completed; rebuilding bridge at Schuylkill river, Orrton, Pa., cost \$246,947, completed; rebuilding bridge over Schuylkill river, Frick Lock, Pa., cost \$151,370, completed; Coatesville, Pa., Pomeroy yard, cost \$208,755, 90 per cent completed; West Mainsville, Pa., east-bound receiving yard and westbound departure yard, cost \$71,714, completed; new bridge over Schuylkill river, Manayunk, Pa., cost \$845,623, completed; new bridge over Leverington avenue, Manayunk, Pa., cost \$135,790, 71 per cent completed; foundations, Sullivan Way, undergrade bridge, Trenton, N. J., cost \$154,857, 86 per cent completed; new engine house and shop facilities, Phillipsburg, N. J., cost \$138,141, 19 per cent completed; freight station and delivery tracks, Harrisburg, Pa., cost \$526,500, 78 per cent completed; revision and enlargement of yard at Meadows, N. J., cost \$1,224,560, 37 per cent completed; relocation work and passenger and freight station and yards, Princeton, N. J., cost \$433,557, 81 per cent completed; westbound receiving and classification yard and transfer facilities Waverly, N. J., cost \$1,507,210, 20 per cent completed; bridge over Avenue R, Newark, N. J., cost \$175,000, completed; covered pier and tracks, Greenville, N. J., cost \$688,171, completed; storage yard and track connections for U. S. Government and submarine boat corporation, Newark, N. J., cost \$144,868, completed; developments between Passaic and Hackensack rivers, Meadow, N. J., cost \$290,306, completed; reconstruction of Baltimore & Potomac tunnels, Baltimore, Md.; cost \$840,874, completed; coal pier and export pier, rearranging track, Baltimore, Md., cost \$541,191, completed; construction of new tracks at south end of Gunpowder river bridge, Maryland, to north end of Bayview yard, 19.5 miles, cost \$1,290,983, 15 per cent completed; extension No. 1 track 6.7 miles between Baltimore and Washington, cost \$456,845, 12 per cent completed; new pier and grain elevator, (Canton), Baltimore, Md., cost \$2,680,011, 30 per cent completed; new engine house and machine shop, etc., Greenwich, Pa., cost \$543,830, 14 per cent completed; South Chester bridge locomotive and car facilities at Thurlow, Pa., cost \$474,730, 1 per cent completed; two-track joint line, Broad street to Delaware avenue and Hoyt street, South Philadelphia, 2 miles, cost \$260,700, 4 per cent completed; South Chester branch closing gap in line 4 miles, track at Chester, Pa., cost \$382,386, 95 per cent completed; additional tracks and revision of Thurlow yard, Marcus Hook, Pa., and Thurlow, Pa., cost \$544,800, 5 per cent completed; new yard, Edge Moor, Del., cost \$2,222,000, 8 per cent completed; additional facilities at engine house, Wilmington, Del., cost \$585,355, 15 per cent completed; track elevation at South Philadelphia, Pa., Pennsylvania portion, cost \$4,231,316, 96 per cent completed, and Philadelphia, Baltimore & Washington portion cost \$753,467, 90 per cent completed; yard at West Philadelphia, cost \$2,147,448, 18 per cent completed; Sixtieth street branch, Fifty-eighth street to Junction with Chester and Philadelphia bridge, Philadelphia, 10 miles, cost \$1,594,602, 42 per cent completed; branch from Chester to Gerard Point, and connection with main line at Eddystone, between Chester and Philadelphia, Pa., cost \$3,091,703, 66 per cent completed; reconstruction of Pequa creek bridge, Pequa, Pa., cost \$184,319, 4 per cent completed; engine terminal at Perryville, Md., cost \$262,287, 1 per cent completed; elimination of grade crossing at Chestnut Hill bridge, Philadelphia, cost \$925,000, completed; extension to engine house, ash pits at Gray's Ferry yard, Philadelphia, cost \$107,990, 12 per cent completed; change of line and grade from Delaware avenue branch, Trenton to Cumberland street, Philadelphia, cost \$623,833, completed; overhead bridge at Trenton, N. J., cost \$148,855, completed; alterations to hog abattoir, Philadelphia, Pa., cost \$162,354, 90 per cent completed; electrification from West Philadelphia to Chestnut Hill, cost \$221,105, and electrification from Philadelphia to Paolia, cost \$1,843,875, completed.

Pennsylvania—Western Lines

First Track: North Columbus, O., to Worthington,* between Worthington and Lewis Center, 8.00 miles.

Second Track: Lewis Center, O., to Delaware 5.06 miles; at Bellaire 2.20 miles; Wardwell to Bristolville 11.60 miles; total 18.86 miles.

Third Track: Leetonia, O., to Alliance Junction, 13.00 miles; Alliance, O., to Maximo, 6.20 miles, at Maximo, O.; at Canton, O.; Mansfield to Toledo Junction; Moravia, O., Lawrence Junction to Mahonington and H. F. Tower; Smithville to Millbrook, O.

Fourth Track: Alliance to Maximo, O., 6.20 miles; at Alliance, O., 3.00 miles; at Maximo, O.; at Canton, O.; Moravia, O.; Lawrence Junction to Mahonington and H. F. Tower.

Other Important Work Under Construction: Raising bridge No. 1 over Allegheny river, Pittsburgh, Pa., cost \$1,654,320, completed; coaling station, Yankee Crossing, O., cost \$110,701, completed; additional yard facilities, Stark, O., cost \$875,084, 90 per cent completed; new freight terminal, Chicago, cost \$4,457,775, completed; viaduct Polk and Taylor streets, Chicago, cost \$300,000, 95 per cent completed; track elevation from Stony Island to State Line, Chicago, cost \$3,519,180, 97 per cent completed; reconstructing bridge over Beaver river, Rochester, Pa., cost \$814,014, completed; receiving and storage track at Kinsman street yard, Cleveland, O., cost \$373,832, completed; track elevation, Cleveland, O., cost \$2,307,371, completed; second track, Bayard-Alliance, O., cost \$809,540, 90 per cent completed; second track grade revision and line change at Summitville, O., cost \$1,524,064, complete except track laying; yard and engine house, Mingo Junction, O., cost \$4,386,071, 50 per cent completed; low grade line from Kenwood to Rochester, Pa., cost \$1,647,288; additional yard facilities, Austinsburg, O., cost \$108,450, completed; relocation main tracks, enlarging yard facilities and engine house facilities, Mosier yard, Ohio, cost \$3,492,000; engine house facilities, Wheatland, Pa., cost \$130,642, completed; second track, Burgoon to Tiffin, O., 11.20 miles, cost \$651,354, under way; track elevation, Columbus, O., cost \$136,752, completed; new engine house layout, Sandusky, O., cost \$208,280, completed; rearranging and enlarging yard, Sandusky-Bay Junction, Ohio, cost \$288,454, completed; rearranging yard facilities, South Akron, O., cost \$532,300, completed.

Philadelphia & Reading

First Track: In Pennsylvania, at various places, 1.00 mile.

Second Track: At Glenmoore, N. J., 1.50 miles; between Reading, Pa., and Harrisburg, 1.50 miles.

Other Important Work Under Construction: Concrete arch bridge over Schuylkill river, Philadelphia, Pa., cost \$915,374, 30 per cent completed; bridge work under way at Tulip and Emerald streets and Erie avenue yard, Philadelphia, cost \$309,196, undergrade crossing, Asylum Road, Trenton Junction, N. J., cost \$113,600, 52 per cent completed; additional track and replacing and extension of bridges, Trenton Junction, to Hope-well, cost \$539,645, 65 per cent completed; additional east and west bound tracks, Belle Meade to Manville, N. J., cost \$732,680, 72 per cent completed; additional tracks Eastwick to Darby Creek, Pa., cost \$211,986, 80 per cent completed; track work, bridge work and drainage at Tulip and Emerald streets and Erie avenue yard, Philadelphia, Pa., cost \$623,969, 80 per cent completed; change in alignment and new yard from Lester to North Essington, Pa., cost \$187,420, completed; engine facilities, Sancon Creek, South Bethlehem, cost \$636,435, 75 per cent completed; east and west bound receiving yard and west bound classification yard, Rutherford, Pa., cost \$106,824, completed; east bound classification yard extension, Rutherford, Pa., cost \$196,512, 85 per cent completed; coaling station and sand house, Philadelphia, Pa., cost \$175,760, completed; engine terminal, Reading, Pa., cost \$264,150, 92 per cent completed; Erie avenue yard, Philadelphia, Pa., cost \$189,453, 72 per cent completed; engine house and machine shop, Philadelphia, Pa., cost \$339,517, 93 per cent completed; 12-stall engine house, Reading, Pa., cost \$226,426, 29 per cent completed; 13-stall engine house, Tulip street yard, Philadelphia, Pa., cost \$255,487, 64 per cent completed; additional east and west bound track, Robeson, Pa., to Sheridan, Pa., and Robeson to Womelsdorf, cost \$350,033, 15 per cent completed; replacing viaduct with arch and fill, McAuley, Pa., cost \$101,558, 10 per cent completed; east bound departure tracks, air testing plant, etc., at Rutherford, Pa., cost \$142,921, 20 per cent completed; engine terminal, South Bethlehem, cost \$626,525, 7 per cent completed; smoke elimination, boiler washing plant heating plant for engine house, Erie avenue yard, Philadelphia, Pa., cost \$109,987, 13 per cent completed; additional main track, Blandon, Pa., to Fleetwood, cost \$161,158, 18 per cent completed; new machine shop and engine house, Rutherford, Pa., cost \$288,468, 25 per cent completed; engine house facilities, Darby Creek, cost \$358,848, 16 per cent completed; extension fourth track, Wissahicken avenue to Falls bridge, Philadelphia, Pa., cost \$249,091, under way.

Pittsburgh & Lake Erie

Other Important Work Under Construction: Enlargement of terminal yard and building new facilities, Hazelton, O., cost \$2,201,588, 35 per cent completed; revision of main line, Lowellville to Struthers, O., cost \$520,889, 48 per cent completed; improvements at Groveton, Pa., including additional yard tracks, change of grade and alignment, signals and inter-locker, coaling plant, water station, ash plant and sand house, cost \$430,000, 12 per cent completed; rebuilding coach and tender shop, McKees Rocks, Pa., cost \$253,787, completed; extension of east ward yard, McKees Rocks, cost \$631,000, 3 per cent completed; central warehouse, Pittsburgh, cost \$157,746, completed; replacing viaduct with embankment, Rankin, Pa., cost \$605,770, 28 per cent completed; Lynch classification yard, Port Vue, Pa., cost \$209,828, 70 per cent completed;

Pittsburgh, Cincinnati, Chicago & St. Louis

First Track: Indianapolis & Frankfort R. R., Frankfort, Ind., to Ben Davis, 42.10 miles.

Second Track: Alton to Glade Run, O., between Horatio, O., and Onward, Wheeling Junction, W. Va., to East Steubenville, 1.00 mile; Glenn's Run, W. Va., to Wheeling, 5.19 miles; Philadelphia, Ind., to Irvington, 9.08 miles; at Hawthorne Yard, Indianapolis, Ind., 1.77 miles; at Ben Davis, Ind., 0.31 mile; at Frankfort, Ind., 1.80 miles.

Third Track: Trimmer, Ind., to Boone, 6.34 miles.

Other Important Work Under Construction: New freight station and track layout, Kokomo, Ind., cost \$132,322, completed; new joint yard, additional main tracks and grade changes, Logansport, Ind., cost \$766,714, completed; track elevation Thirty-ninth street to Sixty-ninth street, Chicago, cost \$6,549,405, 45 per cent completed; second track, Wheeling Junction, W. Va., to East Steubenville, cost \$192,888; grading 74 per cent completed, and track laying 52 per cent completed; Chester, W. Va., to state line at Philpsburgh, Pa. (new Cumberland & Pittsburgh, Ry.), cost \$1,556,867, grading 92 per cent completed, bridge work 72 per cent completed; additional yard facilities, Bradford, O., cost \$434,122, completed; yard facilities and construction of joint yard with Pennsylvania, Western Lines, Columbus, O., cost \$1,097,992, work begun; improvements to engine house facilities, Columbus, O., cost \$364,499, 25 per cent completed; improved yard facilities, Dennison, O., cost \$1,663,690, to be completed by June, 1919; engine house and shop facilities, Chicago, cost \$490,866, completed; new yard, engine house and yard facilities, Jefferson, Ind., cost \$1,228,000, grading and masonry under way; new joint freight yard, east of Belt Railway at Indianapolis, Ind., cost \$1,669,352, 92 per cent completed; Indianapolis track elevation, South to Downey streets, cost \$347,951, completed; from Cruise to Noble streets, cost \$966,006; Ohio river bridge, Louisville, Ky., cost \$3,334,474, completed; track elevation, Delta to Stanley avenues, Cincinnati, O., cost \$427,211, completed; freight station facilities, Cincinnati, O. (Cincinnati, Lebanon & Northern Railway), cost \$301,782, grading 20 per cent completed; construction and rearranging track in east yard, Terre Haute, Ind., cost \$118,400, and improvements to shop facilities, cost \$143,045, completed; improvements to station and track facilities, Frankfort, Ind., cost \$189,427, completed; grade reduction passenger siding and track changes from Frankfort to Logansport, Ind., cost \$630,015, to be completed by July, 1919.

Pittsburg & Shawmut

Other Important Work Under Construction: Permanent lining of Coulter tunnel, Coulter, Pa., cost \$243,180, 19 per cent completed.

Portland Terminal Company

Third Track: At Portland, Me., 0.32 mile.

Fourth Track: At Portland, Me., 0.36 mile.

Puget Sound & Cascade

First Track: In Washington, not specified, 2.00 miles.

Raritan River

Other Important Work Under Construction: Engine terminal at South Amboy, N. J., cost \$200,000, 25 per cent completed.

Richmond, Fredericksburg & Potomac

Other Important Work Under Construction: Double track reinforced concrete bridge over James river, at Richmond, Va.; R. F. & P. proportion of cost, \$211,589, 74 per cent completed; track depression, Richmond, Va., cost \$323,080, 95 per cent completed.

Rutland Railroad

Other Important Work Under Construction: New shops, Rutland, Vt., cost \$277,700, completed.

St. Joseph & Grand Island

Other Important Work Under Construction: Reconstruction of bridge over Mississippi river, St. Joseph, Mo., cost \$1,174,056, 98 per cent completed.

San Diego & Arizona

First Track: Clover, Cal., to Jacumbo Siding, 25.28 miles.

Sand Springs

First Track: Between Tulsa, Okla., and Sand Springs, 3.00 miles.

Southern Railway System

First Track: From Central, S. C., to Tugalo river, 38.80* miles; from Tugalo river, Ga., to Cornelia, 13.10* miles; total 51.9* miles.

Second Track: In North Carolina from M. P. 383.5 to 391.4, from M. P. 391.7 to M. P. 407.4, and from M. P. 409.9 to M. P. 416.6, 15.83 miles; from Blacksburg, S. C., to Gaffney, 6.17 miles; Gaffney to Cowpens, 7.83 miles; Cowpens to Mt. Zion, 5.05 miles; M. P. 485.6 to M. P. 487.3, 3.27 miles; Central, S. C., to Tugalo river, 19.40 miles; Tugalo river, Ga., to Cornelia, 6.50 miles; total, 64.05.

*Replacing old line.

Other Important Work Under Construction: Additional main tracks building from Belmont to Bessemer City, N. C., cost \$865,402; Bessemer City to Blacksburg, S. C.; Gaffney to Cowpens, S. C., cost \$897,551; Cowpens to Mt. Zion, S. C., cost \$596,664; and from Greer, S. C., to Greenville, cost \$628,518; yard and engine terminal facilities, Selma, N. C., cost \$319,511, completed; new yard facilities, Monroe, Va., cost \$359,522, completed; new yard and engine terminal, Pomona, N. C., cost \$929,771, completed; yard and engine terminal, Hayne, S. C., cost \$437,097, 98 per cent completed; yard and engine terminal, Alexandria, Va., cost \$451,226, completed; Warrior river bridge, Barney, Ala., cost \$125,000, masonry completed; draw bridge at Congree river, cost \$117,000, 60 per cent completed; second hand steel bridge over Catawba river, cost \$176,000, completed; Toccoa, to Ayersville, Ga., North Broad river viaduct, Toccoa yard track, and 8 miles of additional track, to cost \$1,524,520, 97.3 per cent completed; viaduct at Birmingham, Ala., cost \$199,705, 80 per cent completed.

Southern Pacific

First Track: Between Colusa, Cal., and Hamilton, 12.81 miles; Hoover, Ore., to Idanha, 1.94 miles.

Second Track: Between Tucson, Ariz., and Stockham, 1.97 miles.

Other Important Work Under Construction: Enlarging and putting in concrete lining to the San Fernando tunnel (Cal.), cost \$187,263, 20 per cent completed; protection work for classification yard at Los Angeles, Cal., cost \$173,190, completed; constructing 28 miles of belt line, Calipatria, cost \$537,060, 40 per cent completed; building second track, Kern Junction, to Sivert, Cal., cost \$366,579, 1 per cent completed; second track from Cameron to Tehachapi, Cal., cost \$769,312, 2 per cent completed, and from Cameron to Mojave, 9 miles, cost \$272,070, 2 per cent completed; new terminal facilities, Bay Shore, Cal., cost \$861,762, 97 per cent completed; filling and grading at Sacramento, Cal., cost \$147,170, 2 per cent completed; new wharf facilities at Oakland Pier, \$437,300, 20 per cent completed; wood preserving works at Oakland, cost \$324,730, 3 per cent completed; dredging and bulkheading at West Alameda, cost \$14,320, 22 per cent completed; enlarging tunnels (3 to 12 inclusive) between Cisco, Cal., and Lakeview, cost \$106,360, 98 per cent completed; terminal facilities, Deming, N. M., cost \$263,191 and terminal facilities at Bowie, Ariz., cost \$223,393, both to be completed by March, 1919.

Staten Island Rapid Transit Co.

Other Important Work Under Construction: Track for new coal yard at Arlington, S. I., cost \$120,224, 83 per cent completed.

Stouts Mountain & Hanceville

First Track: Hanceville, Ala., to Stouts Mountain, 7.60 miles.

Tampa Southern

First Track: Orient, Fla., to Palmetto, 36.00 miles.

Texas & Pacific

Other Important Work Under Construction: Reconstruction of engine terminal, Texarkana, Texas, cost \$110,000, 40 per cent completed.

Tidewater Southern

First Track: Manteca, Cal., to South Manteca, 2.00 miles.

Toledo & Ohio Central

Other Important Work Under Construction: Engine terminal, Columbus, Ohio, cost \$433,000, 74 per cent completed; shortening, enlarging and lining tunnel at Moxalala, Ohio, cost \$120,000, 28 per cent completed; from Pleasantville to Eckerts, Ohio, low grade line 10.5 miles, cost \$500,000, 80 per cent completed.

Toledo, St. Louis & Western

Other Important Work Under Construction: Reconstruction of bridge over Wabash river, Silverwood, Ind., cost \$144,000, completed.

Union Freight

First Track: At Boston, Mass., 0.17 miles.

Union Pacific

First Track: Boulder, Colo., branch to coal mine, 2.17 miles; Hastings, Neb., through C. B. & Q., crossing, 0.10 miles; Winton, Wyo., branch to coal mines, 1.85 miles; total, 4.12 miles.

Second Track: In Wyoming, east end of Sherman tunnel to Hermosa, 1.25 miles.

Other Important Work Under Construction: Reconstructing substructure bridge No. 38, Waterloo, Neb., cost \$151,730, completed; lining tunnel with concrete, Aspen, Wyo., cost \$455,064, completed; reconstruction of James street viaduct at Kansas City, Kan., Union Pacific share, \$151,697, 1 per cent completed; second track, Manhattan to Junction City, Kan., 20.5 miles, cost \$931,942, 70 per cent completed; additions to roundhouse and tracks, Grand Island, Neb., cost \$128,226, completed; coal facilities, Grand Island, cost \$155,404, 98 per cent completed; passenger station, North Platte, Neb., cost \$175,640, completed; track changes in yard, Laramie, Wyo., cost \$177,216, 70 per cent completed; concrete snow sheds, Laramie, Wyo., to Ogden, Utah, cost \$959,163, 99 per cent completed; track changes in yard, Rawlins, Wyo., cost \$104,339, 98 per cent completed; engine terminal, Kansas City, Kan., cost \$238,180, 99 per cent completed; army camp facilities, Funston, Kan., cost \$136,695, 92 per cent completed; engine terminal, Ellis, Kan., cost \$378,658, 98 per cent completed; coach repair yard, Denver, Colo., cost \$107,600, 96 per cent completed; engine terminal, Marysville, Kan., cost \$275,733, 92 per cent completed; engine terminal, Hastings, Neb., cost \$253,139, completed; passenger station, Grand Island, Neb., cost \$152,050, completed; freight station, Salina, Kan., cost \$192,733, 80 per cent completed; coal station, Laramie, Wyo., cost \$101,991, 97 per cent completed; power house, Omaha, Neb., cost \$594,279, and machine shop extension, cost \$159,667, both completed; Winton branch, Wyoming, extension 4.38 miles, cost \$212,000, 91 per cent completed; engine terminal, Green River, Wyo., cost \$997,996, 5 per cent completed; engine terminal, Council Bluffs, Ia., cost \$1,688,501, 5 per cent completed; engine terminal, Junction City, Kan., cost \$1,220,034, 10 per cent completed; coal and ash handling facilities, Sidney, Neb., cost \$194,050, contract let; machine shop extensions, Omaha, Neb., cost \$546,571, contract let; machine shop, Cheyenne, Wyo., cost \$1,713,463, contract let.

Union Railroad

Other Important Work Under Construction: Building 5 miles double track, branch line to Clairton, Pa., track to be laid in 1919.

Virginian Railroad

First Track: Extension of Stone Coal branch, Laurel Fork, 2.34 miles; Piney Creek extension from Pemberton, W. Va., to Fireco, 7.40 miles; Upper Piney Creek branch, Fireco, W. Va., to Piney Fire Creek Coal Co., 2.40 miles; Beards Fork branch, 2.49 miles, Beards Fork.

Second Track: Q. M. Junction, Va., to Carolina Junction, 8.00 miles; in West Virginia, M. P. 366.4 to M. P. 371.5, 5.10 miles; total 13.10 miles.

Other Important Work Under Construction: Additions and improvements to coal pier, Sewalls Point, Va., cost \$703,317, 99 per cent completed.

Western Maryland

First Track: Branch line (Somerset Coal Railway), Grays Junction, W. Va., to Bell; branch line, Fairmont, W. Va. (Fairmont, Helens River Railway).

Second Track: Security, Md., to Hagerstown; from Big Pool, Md., to Clear Springs, 5.65 miles.

Other Important Work Under Construction: Yard and engine terminal, Bowest, Pa. (Connellsville), cost \$315,000, 75 per cent completed; additional yard tracks, Hagerstown, Md., cost \$315,000, 15 per cent completed; passing siding from Cumberland, Md., to Big Pool, cost \$150,000, 30 per cent completed; second track, Clear Spring, Md., to Williamsport, cost \$605,000, 35 per cent completed; second track, Knobmount, W. Va., to Seymour, cost \$175,000, 15 per cent completed.

Western Pacific

Other Important Work Under Construction: Replacing bridge No. 139,79 at American river, Sacramento, Cal., cost \$259,468, 99 per cent completed; replacing bridge No. 177.80 South Yuba river, Marysville, Cal., cost \$121,170, 75 per cent completed.

Western & Atlantic

Other Important Work Under Construction: Engine terminal at Hills Park (Ga.) yard near Atlanta, cost \$360,000, 20 per cent completed.

West Jersey & Sea Shore

Other Important Work Under Construction: Drawbridge at Racoon Creek, Bridgeport, N. J., cost \$177,562, 10 per cent completed; raising big timber creek bridge, Westville, N. J., cost \$106,533, completed; track elevation and elimination of grade crossings, Camden, N. J., cost \$358,462, 44 per cent completed, and elevating track Spruce to Everett streets, cost \$775,013, completed.

Wheeling & Lake Erie

Second Track: Gambrinus, Ohio, to Kemery, 2.71 miles; Harmon to Lonas, 1.33 miles; total 4.04 miles.

Other Important Work Under Construction: New yard and terminal facilities, Jewett, Ohio, cost \$100,000, 96 per cent completed; yard tracks, Canton, O., cost \$250,000, completed; new freight station, Canton, O., cost \$206,000, 98 per cent completed, except paving.

Yazoo & Mississippi Valley

Second Track: Baton Rouge, La., to North Baton Rouge, 3.01 miles.

Other Important Work Under Construction: Second track from Marionette to Prichard, Miss., 11.53 miles, cost \$275,900, 45 per cent completed; raising track in Cleveland district, 20 miles, cost \$381,890, completed; shop buildings, Baton Rouge, La., cost \$143,430, completed.

Railroad Construction in Canada in 1918**Canadian Northern**

First Track: Glidden, Sask., westerly 21.60 miles; Moose Jaw (Sask.) terminals, 0.90 mile; Bonar, Alta., southwesterly 2.20 miles; total 24.70 miles.

Canadian Pacific Western Lines

Other Important Work Under Construction: Building six-mile line from York, B. C., cost \$200,000, 60 per cent completed.

Essex Terminal Railway

First Track: Ojibway, Ont., to Quarry of Amherstburgh, 9.20 miles.

Grand Trunk Pacific

First Track: Duro, Sask., to Engen, 3.23 miles; Harfield to Yorath, 0.95 mile; total 4.18 miles.

Other Important Work Under Construction: Coal mixing plant at Edson, Alta., cost \$120,000, 40 per cent completed; repairs and alterations to roundhouse at Rivers, Man., cost \$100,000, completed; extensions to roundhouses at Melville, Sask., Biggar and Edmonton, Alta., cost \$100,000, completed; Pine and Mule Creek diversion mile 91 to 94, provision of earth dump to make permanent line over these creek beds, cost \$450,000, 15 per cent completed.

Intercolonial

Other Important Work Under Construction: Terminal facilities at Halifax, cost \$2,849,000, 90 per cent completed; additional train track extensions to freight sheds and track rearrangement at deepwater terminal, Halifax, cost \$130,000, 90 per cent completed.

Pacific Great Eastern

First Track: In province of British Columbia, 30.00 miles.

Sydney & Louisburg

First Track: Bridgeport, N. S., to New Man Shaft, 1.00 mile.

Toronto, Hamilton & Buffalo

Second Track: Stoney Creek, Ont., to Kinnear, 4.28 miles.

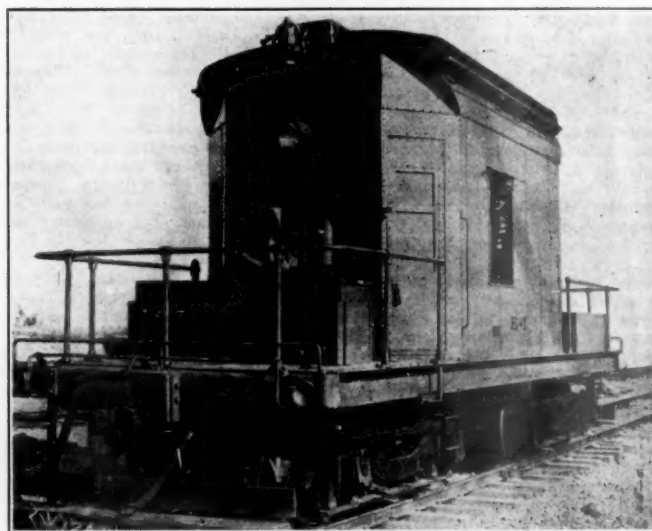
Other Important Work Under Construction: Sorting yard at Bridgebury, Ont., cost \$300,000, 60 per cent completed; replacing steel viaducts at Stoney Creek, Ont., cost \$130,000; at Hamilton, improvements under-way including extension of Kinnear freight yard and extension to shop buildings, cost \$128,200.

Lake Huron & Northern Ontario

First Track: In the Province of Ontario, 66.00 miles.

Railroad Construction in Mexico in 1918**Tampico Panuco Valley**

First Track: Panuco, Vera Cruz to Los Indios, 10.00 miles.



The Gas-Electric Locomotive Used at the Aberdeen, Md., Proving Grounds

Doings of the United States Railroad Administration

Telegraph Operators Receive Increase; Few Developments in Closing Week of 1918

WASHINGTON, D. C.

THE RAILROAD ADMINISTRATION has authorized the resumption of a limited amount of advertising of passenger service to begin soon after the first of the year. Such advertising has been almost completely discontinued during the war. It is proposed now to use advertising for new service and seasonal service such as that to Florida, the South and California. The advertising will be devoted principally to localities and will not be in the name of individual railroads, but as it will be used mainly in cities where there are consolidated ticket offices they will be referred to for information as to routes and schedules.

Further Wage Increase for Telegraph Operators

Director General McAdoo has issued the following Supplement No. 13 to General Order No. 27, making a further revision of the wage scales of telegraph operators and similar employees on the basis of a minimum of 48 cents per hour:

Effective October 1, 1918, for positions held by telegraphers, telephone operators (except switchboard operators), agents, agent telegraphers, agent telephoners, towermen, levermen, tower and train directors, block operators and staffmen, the following rates of pay, rules for overtime, and working conditions upon railroads under federal control, are hereby ordered, superseding General Order No. 27, its Supplements Nos. 10 and 11, and in lieu thereof.

ARTICLE I.

(a) All employees herein specified shall be paid on the hourly basis except those provided for in Article IV.

(b) To determine the hourly basis for positions held by monthly paid employees, multiply by 12 the regular monthly rate in effect as of January 1, 1918, prior to the application of General Order No. 27 (exclusive of all compensation for extra services), divide by 306 (number of working days for the year), and apply provisions of Section (e) of this article.

(c) To determine the hourly rate for positions held by weekly paid employees, multiply by 52 the regular weekly rate in effect as of January 1, 1918, prior to the application of General Order No. 27 (exclusive of all compensation for extra services), divide by 306 (number of working days for the year), and apply provisions of Section (e) of this article.

(d) To determine the hourly rate for positions held by daily paid employees, multiply the daily rate in effect as of January 1, 1918, prior to the application of General Order No. 27 (exclusive of all compensation for extra services), by 365, divide the result by 306 (number of working days for the year), and apply provisions of Section (e) of this article.

(e) Employees who were on January 1, 1918, prior to the application of General Order No. 27, paid on a basis of 10 hours or more to constitute a day's work, shall receive one-eighth of the wages received for 10 hours on January 1, 1918, prior to the application of General Order No. 27, as their basic hourly rate; employees working less than 10 hours and over 8 hours shall receive one-eighth of the wages received for the number of hours recognized as a day's work.

(f) Where there are no regularly assigned or established daily hours, for the purpose of computing the hourly rate, daily hours shall be regarded as ten, one-eighth of which will be the hourly rate.

(g) In determining the hourly rate, fractions less than one-fourth of one cent shall be as one-fourth of one cent; over one-fourth and under one-half, as one-half cent; over one-half and under three-fourths, as three-fourths of one cent; over three-fourths, as one cent.

ARTICLE II.—RATES OF PAY.

For positions held by telegraphers, telephone operators, (except switchboard operators), agents (except as provided in Article IV.), agent telegraphers, agent telephoners, towermen, levermen, tower and train directors, block operators and staffmen, to the rates in effect on January 1, 1918, prior to the application of General Order No. 27, add 13 cents per hour and 2 cents per hour additional in lieu of vacations (applicable to all roads irrespective of present practice). Where this increase fails to establish a rate of 48 cents per hour, establish a minimum rate of 48 cents per hour.

ARTICLE III.—PRESERVATION OF RATES AND CLASSIFICATION.

(a) The minimum rates and all rates in excess thereof, as herein established, and higher rates which have been authorized since January 1, 1918, shall be preserved.

(b) The entering of employees in the positions occupied in the service or changing their classification or work shall not operate to establish a less favorable rate of pay or condition of employment than is herein established.

(c) Where existing pay roll classification does not conform to Article II, employees performing service in the classes specified therein, shall be classified in accordance therewith.

ARTICLE IV.—EXCEPTIONS.

The provisions of this order will not apply:

(a) To cases where salaries less than \$30 per month are paid to individuals for special service which only takes a portion of their time from outside employment or business.

(b) To agents whose compensation as of January 1, 1918, was upon a commission basis, or upon a combination of salary and commissions (not including express or outside commissions).

(c) To agents whose duties are supervisory and who do not perform routine office work, nor the small non-telegraph stations (except where they are now included in agreements), which, on account of the varying character and extent of their work and responsibilities, can not be intelligently treated as a class.

The federal manager on each railroad is hereby instructed to consider the individual cases of the smaller non-telegraph stations, or stations paid on a commission basis or on a combination of salary and commission, both as to compensation and working conditions, with committees of employees, and where agreement can be reached are authorized to put the same into effect.

In case of disagreement, either as to compensation or working conditions, or as to whether a station comes properly under the terms of this article, the exact points of such disagreement shall be reported to the Board of Railroad Wages and Working Conditions through the regional director for consideration and recommendation to me.

ARTICLE V.—HOURS OF SERVICE—OVERTIME AND CALLS.

(a) Eight consecutive hours, exclusive of the meal hour, shall constitute a day's work, except that where two or more shifts are worked, eight consecutive hours with no allowance for meals shall constitute a day's work.

(b) Overtime shall be computed at the rate of time and one-half time. Even hours shall be paid for at the end of each pay period; fractions thereof will be carried forward.

(c) When notified or called to work outside of established hours, employees will be paid a minimum allowance of two hours at overtime rate.

(d) Employees will not be required to suspend work during regular hours or to absorb overtime.

ARTICLE VI.—UNITED STATES MAIL.

When the carrying of United States Mail and Parcel Post by the employees herein specified becomes unduly burdensome or interferes with the proper operation of trains, they will be relieved from such work.

ARTICLE VII.—DISCIPLINE AND GRIEVANCES.

(a) An employee disciplined, or who considers himself unjustly treated, shall have a fair and impartial hearing, provided written request is presented to his immediate superior within five days of the date of the advice or discipline, and the hearing shall be granted within five days thereafter.

(b) A decision will be rendered within seven days after completion of hearing. If an appeal is taken, it must be filed with the next higher official and a copy furnished the official whose decision is appealed within five days after date of decision. The hearing and decision on the appeal shall be governed by the time limits of the preceding action.

(c) At the hearing, or on the appeal, the employees may be assisted by a committee of employees, or by one or more duly accredited representatives.

(d) The right of appeal by employees or representatives, in regular order of succession and in the manner prescribed, up to and inclusive of the highest official designated by the railroad to whom appeals may be made is hereby established.

(e) An employee on request will be given a letter stating the cause of discipline. A transcript of the evidence taken at the investigation or on the appeal will be furnished on request to the employee or representative.

(f) If the final decision decrees that charges against the employee were not sustained, the record shall be cleared of the charge; if suspended or dismissed the employee will be returned to former position and paid for all time lost.

(g) Committees of employees shall be granted leave of absence and free transportation for the adjustment of differences between the railroad and the employees.

(h) Where the time limits in discipline and grievance rules now in effect are more extensive, they may be preserved.

ARTICLE VIII.—RULES FOR APPLICATION OF THIS ORDER.

(a) The pay for female employees, for the same class of work, shall be the same as that of men, and their working conditions must be healthful and fitted to their needs. The laws enacted for the government of their employment must be observed.

(b) If the operation of this order creates either unreasonably low, or excessively high rates, for service, individual cases and circumstances considered, it will be the duty of the Board of Railroad Wages and Working Conditions to investigate, on complaint, and recommend equitable treatment therefor.

(c) Vacations with pay are abolished, effective January 1, 1919.

ARTICLE IX.—INTERPRETATION OF THIS ORDER.

The rates of pay and rules herein established shall be incorporated into existing agreements and into agreements which may be reached in the future, on the several railroads; and should differences arise between the management and the employees of any of the railroads as to such incorporation, intent or application of this order, such question of differences shall be referred through the director of the Division of Labor as prescribed in Supplements 6 and 6a to General Order No. 27 for decision, subject always to review by the director general.

Agreements or practices, except as changed by this order, remain in effect.

In a statement accompanying the order Director General McAdoo said:

"In reaching the conclusions upon which this order is

based, I have given special consideration to the problem presented of work on Sundays and holidays. I am in full sympathy, as every reasonable man must be, with the natural desire of the employees to be released from Sunday and holiday labor as far as possible. Not only are employees the better for such periods of rest and recreation, but they naturally prefer for that purpose Sundays and holidays, because all the habits of our people are so adjusted that rest and recreation are more feasible and satisfactory on those days than on other days.

"I am satisfied that in the past there has been a great deal of unnecessary work on Sundays and holidays, and that methods can and must be adopted to confine such work in the future to what is necessary. At the same time we must face the fact that the entire public expects the railroads to be operated on Sundays and holidays as well as on other days; hence it is impossible to adopt any plan which will eliminate Sunday and holiday labor.

"This order which I am promulgating will, in itself, go far toward eliminating Sunday and holiday work wherever practicable, and toward reducing such work where it cannot be eliminated to the fewest number of hours. This will result from the fact that hereafter all such work will be paid on an hourly basis instead of on a monthly basis, as has been true in the past to a considerable extent. Therefore, the employing officer will realize that he must pay additionally for every hour of Sunday and holiday work, and his anxiety to prevent unnecessary expense will be a strong inducement to eliminate unnecessary work on those days. I regard this as a great step forward, and I believe I am justified in expecting that it will bring about a marked reduction in Sunday and holiday work of an avoidable character.

"I propose to supplement this action by definite orders that a special study must be made for the purpose of eliminating Sunday and holiday work wherever practicable, and, where it cannot be eliminated, of minimizing it to the fewest number of hours. I believe the special effort which will consequently be made in this direction will, coupled with the strong inducement arising from the new basis of payment, bring about an early and substantial reform in this important matter.

"Employees who have heretofore had to work on Sundays and holidays will get through this order a direct compensation for that condition, by reason of the fact that their hourly rates of pay in the future will be, to a large extent, substantially increased, as from an examination of Article I, it will be seen that in determining the hourly wage a divisor of 306 days has been used, which will, in a large measure, compensate for punitive Sunday and holiday overtime.

"It has not been practicable to adopt a plan for paying a punitive overtime rate for time worked on Sundays and holidays. The object for such punitive allowances is to impose a penalty or punishment for the work to which the allowances attach. In the nature of things, it is unjustifiable to impose such punishment in respect of work which cannot be avoided. Such punitive allowance is not necessary to cause the elimination of such work, or its reduction to a minimum, because that result can and will be brought about by the adoption of the hourly rates and special instructions which will be issued to reduce Sunday and holiday work where practicable."

Successful Handling of Oil Traffic

W. E. McEwen, chairman of the transportation committee of the Western Petroleum Refiners' Association, has written a letter to Director General McAdoo, expressing appreciation of the "magnificent efforts made by the United States Railroad Administration during the war period to render a transportation service to the oil industry that would enable it to meet the demands made upon it by the United States

government, its allies and industries engaged in war work.

"It is perhaps safe to say," he said, "that no single industry was more important in the successful carrying on of the war than the oil industry, and in its early days it was realized that if the problems before us were to be met, the transportation question, involving the movement of petroleum and its products, required the closest attention. With this in mind, the oil industry appealed to the United States Railroad Administration for assistance in working out a plan by which the mileage on the tank cars might be doubled without any material increase in the tank car equipment, in order that the steel might be conserved for other important purposes.

"The appeal met with a hearty response and in the western district the regional directors appointed B. L. Swearingen as supervisor of oil traffic, with headquarters at Kansas City, to supervise the movement of oil traffic in the western district. The writer was appointed by the oil industry to co-operate with Mr. Swearingen and secure the assistance and help of the shippers.

"J. A. Middleton was assigned by the Railroad Administration at Washington to the oil division of the United States Fuel Administration, who in turn appointed O. M. Conley at Kansas City to also render assistance in meeting the emergency, Mr. Middleton afterward being succeeded by O. M. Conley at Washington, and F. B. McKay succeeding Mr. Conley.

"These joint offices were opened early in April when conditions were chaotic, and when a great many of the refineries in the mid-continent field in particular, were shut down or only partially operating on account of shortage of equipment. The refiners were requested to work as a unit and assist in consolidating the oil shipments into trainload lots, and this request was met with a hearty response. The Railroad Administration arranged to consolidate this freight, symbol it, and move it through to destination or breaking point in solid trainload lots.

"Without going into the details of the matter it suffices to say that within 30 days there was such an improvement that from that time on there was never a shortage of tank cars in the oil industry in the western field. There never was a demand made upon the western oil industry that it was not able to meet so far as transportation facilities were concerned. There never was a time that there was not at least a day and a half's loading of cars on hand. During the first 10 months of the year there was loaded from the mid-continent field 256,082 cars, compared with 200,603 cars for the same period of 1917, an increase of 55,479 cars, with practically no increase in the amount of equipment. From April 20 to November 30 inclusive, there was loaded from the mid-continent field a total of 3,585 solid trains of oil, containing 100,530 cars.

"In the month of January the mileage per car per day on tank cars of Western refiners was 26.16; in June 56.27, and in September 58.4, an increase of 100 per cent in the mileage performance.

"What was accomplished in the oil industry is one of the most concrete illustrations in the history of railroading of the economic gain by the co-operation between the shipping public and the railroads. These accomplishments were made possible by the whole-hearted co-operation, starting with the yard employees of the railroads, and on up the line, including the operating officials and car service section at Washington, railroad executive officials at Washington, and particular mention should be made of the magnificent co-operation rendered by the three western regional directors and their assistants. This coupled with the unselfish efforts of the refiners in lending their assistance in carrying out the systems adopted, made possible the meeting of all problems confronting the industry from a transportation standpoint in the western district.

"On July 1 the traffic department of this organization was asked to represent the tank car committee of the petroleum war service committee, in order to supervise in behalf of the shippers the entire tank car equipment of the industry, and while the industry as a whole regret the necessities that compel you to resign your position as director general of railroads, we want you to feel that we owe a debt of gratitude to you and appreciate to the utmost the magnificent assistance rendered, and it would be a source of keen regret were this economical method of handling freight to be dispensed with, as the systems devised enable the railroads to handle more freight with less equipment, saves congestion in terminals by reason of the trains moving through solid, and is of equal benefit to the shippers, the railroads, and the public at large.

"While the jurisdiction of the Kansas City office only extended to the territory west of the Mississippi river and Chicago, I also want to commend the eastern regional directors and their assistants for the hearty co-operation rendered in the movement of the very large tonnage that originated in this field that moved to the seaboard for export and to the large industrial institutions of the East in meeting the war problems."

To Retain Skilled Railroad Men

The mechanical department of the Division of Operation is taking steps to prevent the possible loss of trained shop employees to the railroad service as a result of any reduction in force which may seem necessary at particular points. If the men are not needed at one place arrangements will be made to locate them elsewhere, as it is believed that more men instead of less men will be needed in the next few weeks. Frank McManamy, assistant director of the Division of Operation, has addressed a letter to the regional directors stating that a number of cases have recently been brought to his attention where in the readjustment of shop forces skilled workmen have been laid off.

"Every trained railroad employee represents a certain definite investment," Mr. McManamy said, "therefore, when reorganizations make reductions in forces necessary, all reasonable efforts should be made to retain these men in railroad service. Before a reduction in force is made at any point, steps should be taken to ascertain if the men to be laid off can not be profitably used at some other point, either on that line or on some other line within your region, in which event transfer should be made and transportation provided.

"If the men cannot be profitably used in your region, this office should be advised, giving the number of skilled workmen to be released and their occupation, so that efforts may be made to place them elsewhere, thus retaining in railroad service, men who have been trained and are proficient in that line of work."

More Roads Transferred

Effective on December 26, according to Circular No. 68, the Pittsburgh & Lake Erie, the Monongahela, the Pittsburgh & West Virginia, and the West Side Belt Railroad were transferred from the Allegheny region to the Eastern region, and the Grand Rapids & Indiana Railroad was transferred from the Eastern region to the Allegheny region.

Secret Service and Police Section Created

Effective January 1, 1919, according to Circular No. 69, the secret service branch of the Claims and Property Protection section of the Division of Law is terminated, and instead thereof the Secret Service and Police section of the Division of Operation is created. W. J. Flynn is appointed chief of the Secret Service and Police section with office in Southern Railway building, Washington, reporting to the director, Division of Operation. The chief of the Secret Service and Police section will deal through the regional di-

rectors as to matters affecting the police service of the various railroads under the jurisdiction of the several regional directors.

Concurrence of R. R. Administration on

Public Improvements No Longer Required

Director General McAdoo has issued Circular No. 44-A, cancelling Circular No. 44, dated July 29, which requested public authorities to secure the concurrence of the Railroad Administration where public improvements are contemplated for which a portion of the cost exceeding \$500 would be charged against a railroad under federal control.

Orders of Regional Directors

EXPENSES OF AMERICAN CHEMICAL SOCIETY.—Supplement 4 to Circular 136, Southwestern regional director, same as File 102-22A361 of Eastern regional director. (See *Railway Age*, December 27, page 1164.)

Recognition of Federal Manager as Chief Operating Officer.—Circular 148 of the Southwestern regional director, same as file 1500-96A360 of the Eastern regional director. (See *Railway Age*, December 27, page 1163.)

Maintenance of Wires During Winter.—Circular Letter No. 416 of the Southern regional director gives instructions similar to those issued in other regions for the maintenance of telegraph and telephone lines during the winter season. (See *Railway Age*, December 13, page 1078.)

Removal of Coal and Water from Engines.—The Eastern regional director, file No. 500-1-68A336 orders that when engines are moved dead to repair shops it is desired that coal and water be removed before shipment is made.

Violations of Safety Appliance Laws.—In Order 144 the Southwestern regional director states that numerous violations of safety appliance laws and of the director general's order No. 8 are being reported by traveling federal inspectors. He directs that immediate action be taken effectively to stop these violations; car and mechanical department heads should be given to understand that the federal laws and the orders of the director general must be observed.

Insurance and Inspection of Elevators.—In Order 145 the Southwestern regional director quotes a letter from the director of the Division of Finance and Purchases which states that an exception has been made to General Order 24 to provide that the insurance on all passenger and freight elevators in properties operated by the Railroad Administration be continued with the distinct understanding that the insurance carries an obligation on the part of the insuring companies to inspect the elevators with reasonable frequency.

Routing Western Union Shipments.—The Eastern regional director, file No. 600-4-95A320, states that in order to protect the Western Union Telegraph Company in its contractual rights of exchange transportation over many of the lines under federal control, it has been decided that an exception shall be made to the routing provisions of General Order No. 1, and that the Western Union Telegraph Company shall be given the right to route its shipments, and that such routing instructions shall be observed in the future handling of its traffic.

Exchange Transportation Between Carriers of Local Card Passes.—The Eastern regional director, file No. 2100-41A-343 announces that considerable local exchange transportation between carriers has been issued for account of officers and employees frequently traveling on a line of road other than the employing road, either on official business, or journeying between residence and place of business. There are no objections, and in fact it is desirable that such arrange-

ments shall be continued, subject to such local arrangements as to restrictions on trains, suburban zones, or otherwise, as may have heretofore existed.

Disposition of Certain Kinds of Freight.—In Supplement 1 to Circular 116, the Southwestern regional director states that the provision in General Order 34A, calling for the sale of shipments which have been on hand for 60 days after notice of arrival has been given consignees, is not intended to necessitate the holding of commodities of small value, such as sand, coal and low grade ore, the freight and demurrage charges on which may equal or exceed the sale value at the expiration of the two-month period. In some cases it will be found desirable for a road to take over the property for its own use and settle with the owner. In other cases a prompt sale will be advisable, or it will be necessary to unload the property in the best available space.

Acceptance of Embargoed Freight.—In Supplement 1 to Circular 58 the Central Western regional director calls attention to the large accumulation of export freight at Seattle, Wash., occasioned by the non-observance of embargoes. At present there are approximately 3,500 cars of export freight at Pacific ports. In addition, there are about 1,000 cars held back on the line from week to week awaiting opportunity to move into the terminal. There is also a vast amount of export freight unloaded on the ground and on the docks. To avoid a still larger accumulation and to permit the disposition of freight now on hand, embargo restrictions must be observed literally. This applies not only to Pacific ports, but to all points that are embargoed.

Material Requirements.—The Eastern regional director, file No. 3000-446, quotes as follows from a letter received under date of December 6 from the Central Advisory Purchasing Committee:

"Effective at once, it will not be necessary to file through this office, or with the Requirements Division, War Industries Board, any advice as to your requirements.

"The Commodity Section handling specific articles will remain as long as they can be of any service, and as the Central Advisory Purchasing Committee is represented on the most important of these Sections, information or assistance may be secured direct through the Section without handling through the Requirements Division.

"This phase of the work of the department has, therefore, ceased."

Standardization of Corrugated Engine and Tender Hose.—The Eastern regional director, file 500-1-67A339, announces that the Division of Railway Supplies of the War Service Committee of the Rubber Industry of the U. S. A. has recommended to the Railroad Administration that the sizes of corrugated engine and tender hose in conducting water from the tender to the boiler of locomotives be standardized, and that on and after a fixed date the following sizes, only, shall be made and supplied to railroads and railroad equipment companies:

2½ inches x 36 inches	3 inches x 48 inches
2½ inches x 42 inches	3 inches x 54 inches
2½ inches x 48 inches	3½ inches x 36 inches
3 inches x 36 inches	3½ inches x 42 inches
3 inches x 42 inches	3½ inches x 48 inches

Free Transportation for Clergy.—The Eastern regional director, file No. 2100-7A334, refers to instructions of December 4, with respect to half rates for clergy, members of religious orders and account charity.

Effective January 1, 1919, the director general desires that there shall be no change in the past practice of the various railroads with respect to the furnishing of passes to members of the clergy, Sisters of Charity, inmates and managers of charitable or eleemosynary institutions, or otherwise furnished for charitable account. While the general practice is expected to be on the basis of one-half rate as published by the Passenger Traffic Committee, federal and general managers are authorized to issue such passes of this character as it has been the custom for the lines in their charge to issue in the past.

Uniform Method of Handling Hog Shipments.—The

Southwestern and Central Western regional directors in Circulars 149 and 224, respectively, outline instructions regarding the establishment of uniform practice in handling hog shipments to market centers, quoted from a telegram from the Car Service Section. A standing embargo has been placed on all shipments of hogs to or through market centers and to regulate further movements and thereby avoid congestion and prevent loss. The Stabilization Committee of the Food Administration will determine the number of carloads which can be absorbed by each market daily. The terminal managers at each market center will allocate as between various roads the number of carloads of hogs which may be received daily, on the basis of past performance. The transportation officer of each line will allocate the car supply within his jurisdiction on the basis of orders received and the known ability of shippers to load and ship. The plan is now in effect at Chicago, East St. Louis, Sioux City, Milwaukee and South St. Paul.

Inspection of Freight at Interchange Points.—The Eastern regional director, file No. 600-96A337, announces that it is customary at most of the interchange points for each line to have inspectors for examination of freight make an inspection and record as to ventilation, refrigeration, etc., including loading, bracing, stability of packages and general condition of the freight. This was necessary for interline settlements. Under Railroad Administration operation this duplication can be reduced to save labor and avoid delays in moving traffic. As a general practice, therefore, the inspection and record at junction points between federal controlled railroads should be made only by the receiving railroad and by the carrier delivering shipment to consignee or to a line not under federal control.

As a rule, at present, this is already being done by joint car inspectors in the matter of open top cars. This order applies particularly to iceboxes, ventilators and other classes of inspection not heretofore so conducted. There will be local exceptions to this new practice, depending upon the line upon which the ice houses are located and other details, which the respective managers can develop at their several junction points.

Employment of Discharged Soldiers.—In confirmation of a telegram dated December 8, the Eastern regional director, file No. 1200-35-2A315, announces that the Railroad Administration will be allowed to send representatives to various camps, cantonments, etc., to secure such labor as will be available.

While such representatives will not be allowed to deal directly with soldiers to be discharged, or to make contracts or attempt to directly recruit labor within the camp, camp commanders will interpret these instructions in a very broad sense and in such a way as to facilitate, as much as possible, the efforts of the Railroad Administration to secure labor, the details to be worked out between the camp commanders and the representatives of the Railroad Administration; in other words, the properly accredited representatives of the Railroad Administration can go into the camps and, through the commanding officers, direct the men to vacant positions.

It is suggested that one man be designated for each camp to act as a medium between camp commanders and representatives of the various railroads; but if deemed advisable and the commandant will allow, this number may be increased. Possibly this may be best accomplished if each federal manager upon whose territory a camp may be located, shall station someone to keep in touch with the commanding officer at the camp, and list any men who wish to enter the railroad service, and their suitability for such employment, and report them to the federal manager and adjacent federal managers for employment, keeping a list to be compiled and submitted at the end of the month to this office.

General News Department

"Canadian National Railways" is the title now used to designate all of the railways operated by the Canadian Government—the Inter-colonial, the National Transcontinental and the Canadian Northern.

The Union Station in Richmond, Va., just completed, on West Broad street, will be open for business on January 6, at noon. Trains of the Atlantic Coast Line run to this station. The Byrd street station is to be converted into a freight terminal for the Atlantic Coast Line.

Employees of the Pennsylvania Railroad furloughed for military service, up to November 1, numbered 24,712, and it is announced that every one of these who returns honorably discharged can have his former position or another equally good.

W. D. Beck, division superintendent of the Chicago & North Western, at Norfolk, Neb., has been appointed representative of the government in the hearings to be held at San Francisco on wages and working conditions of the employees of the railroad-owned steamship lines on the Pacific Coast.

The Fuel Administration has in preparation a compilation of all rules and regulations promulgated during the life of the administration. This will be brought down to date January 1, 1919, and will be issued as soon thereafter as possible. It will be a bound volume of perhaps 500 pages. All persons desirous of obtaining a copy of this should communicate at once with the Bureau of Education, Washington, D. C.

Railroad Hearings Before Senate Committee

The hearing before the Senate committee on interstate commerce on the question of the disposition of the railroads was postponed from Thursday until Friday of this week. Mr. McAdoo was expected to be the first witness to outline

his views as to why the period of federal control should be extended for five years.

Railway Business Association

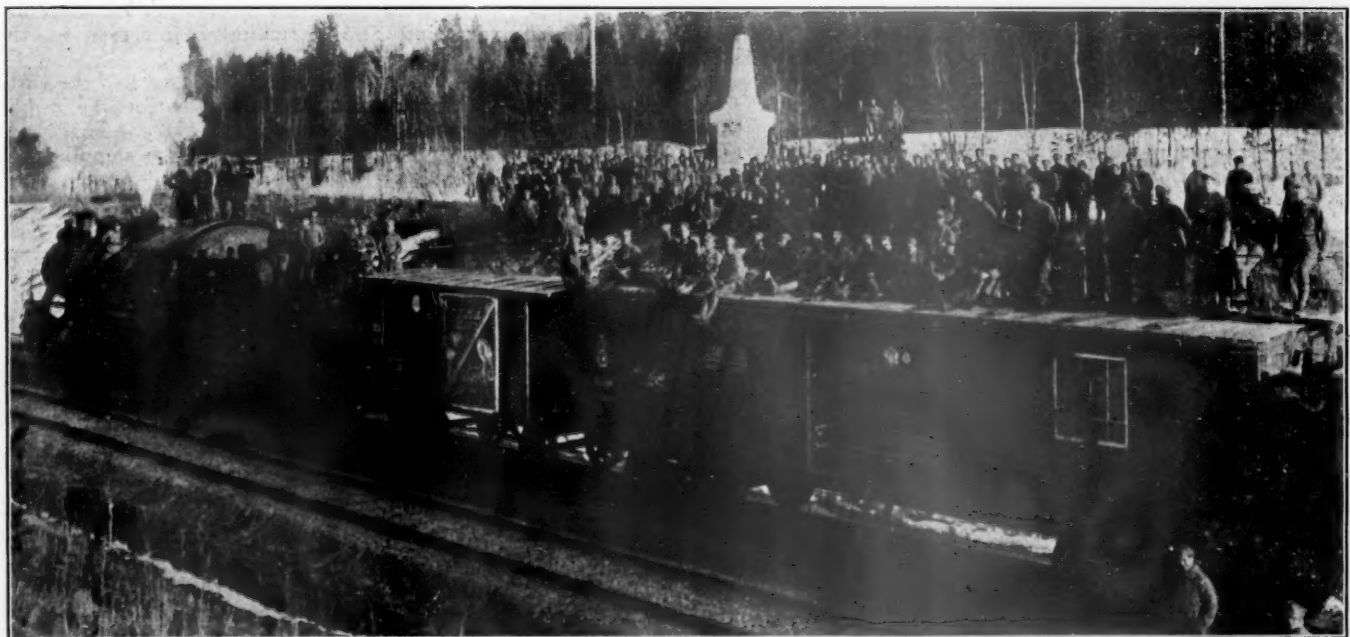
The Annual dinner of this association will be held at Hotel La Salle, Chicago, on January 9. The speakers will be Harry H. Merrick, president of the Chicago Association of Commerce, and vice-president of the Central Trust Company of Illinois; H. H. Westinghouse, chairman of the Westinghouse Air Brake Company, who has just returned from Europe, and Samuel O. Dunn, editor of the *Railway Age*. Alba B. Johnson, president of the Baldwin Locomotive Works, and president of the association, will preside.

Government Increases Pay

of Commercial Telegraphers

The postmaster general on December 31 ordered increases of from 5 to 10 per cent in the wages of employees of the telegraph systems now in control of the department (the Western Union and the Postal). The increases amount to 5 per cent for employees who have been in service between six and eighteen months and 10 per cent for employees longer in service. The increases must advance no salary above \$200 monthly or above an additional \$35 monthly since January 1, 1918. Neither will the increases apply to premium earnings or to employees at nonfunctional offices. Those working on Sunday may accept regular pay scale or demand compensatory time during the following week, as they desire.

The department finds that revenue conditions at this time would not justify the increases now authorized unless, by a careful plan of elimination of waste incident to duplication and by effecting other economies which will not impair the efficiency of the service, the revenue conditions can be made to meet such increases. Believing that this can be done, the order for such increases is accordingly issued.



Czecho-Slovak Troop Train Stopped at the Monument Marking the Boundary Between Europe and Asia

Traffic News

Coal loading for the week ended December 14 amounted to 222,301 cars, as compared with 183,898 in the corresponding week of 1917. The total increase in 1918 up to and including the week ending December 21 over the same period of 1917 was 624,628 cars.

The car service section of the Railroad Administration has cancelled its requirement that agents must observe the Food Administration's regulations regarding the loading of cars with food and feed commodities, but the continued co-operation of shippers is asked in the efforts of the railroads to keep up the loading of cars to their full capacity.

Encouragement of Agriculture

The Railroad Administration has established a homeseekers' bureau, to furnish free information about opportunities for persons who wish to engage in farming, stock raising and kindred pursuits. J. L. Edwards, manager of the agricultural section of the Traffic Division, will have general charge of the work. J. F. Jarrell will be transferred from the Bureau of Suggestions and Complaints to be supervisor of the new bureau. Other members will be C. L. Seagraves, industrial commissioner of the Santa Fe, and W. W. Croxton, general passenger agent of the Atlanta, Birmingham & Atlantic. Standing committees of railroad agricultural agents will collate information by states. The homeseekers' bureau and the railroads will be in a position to give inquirers fresh data concerning the advantages offered by various localities and it is expected that returning soldiers will be aided in finding locations.

Washington Christmas Traffic

Christmas passenger traffic through the Washington terminal this year was the largest in the history of the city, at least a third greater than a year ago, and because of the large number of war workers in the city temporarily, it will, no doubt, be many years before the railroads are called upon to handle anything like the same volume of traffic again. Passengers were induced by advertisements to buy their tickets and engage their accommodations well in advance. The make-up of extra trains was planned so that the work and confusion in the railroad yards was reduced to a minimum. While some trains were late, as a rule they were on time, and there was a noticeable lack of the confusion in the station that has been noted in the past.

Tickets sold in Washington for the period named numbered 111,369 and the revenue was \$731,998. The total number of persons arriving was 256,555; the total departing was 335,000; the number going through was 223,631; the number stopping off in Washington for the holidays was 32,924, and the net exodus from Washington proper was 78,445. Many of these were war workers who will probably not return. The number of pieces of baggage handled was 69,030, and the number

of parcels handled in the parcel room, 27,780, an increase of 50 per cent over a year ago. The number of meals served at the restaurant was one-third larger than a year ago.

To handle this large volume of traffic there were run out of Washington 2,055 sleeping cars and 3,905 passenger coaches, being an increase over a year ago of 686 sleeping cars and 869 coaches. The sleeping cars required 287,700 pillow slips, 493,200 towels, 369,900 sheets, and each sleeping car was equipped with six white coats for the porters, or a total of 12,330. Practically everyone who applied for sleeping car accommodations was accommodated. Extra baggage transfer forces were provided, and on Christmas day there was no delayed baggage left over in the station as has generally been the case.

The smoothness and lack of confusion with which the business was conducted this year is attributed to the fact that it was all directed by one authority which co-ordinated the work of all the departments of all the roads.

The Traffic Club of New York

At the regular meeting of the Traffic Club of New York, held on December 30, the following resolutions were adopted:

Government ownership, management or operation of railroads is not conducive to economic efficiency, and private initiative, enterprise and responsibility in the creation, extension, improvement and operation of the American railroads should, as a matter of national policy, be fostered and preserved.

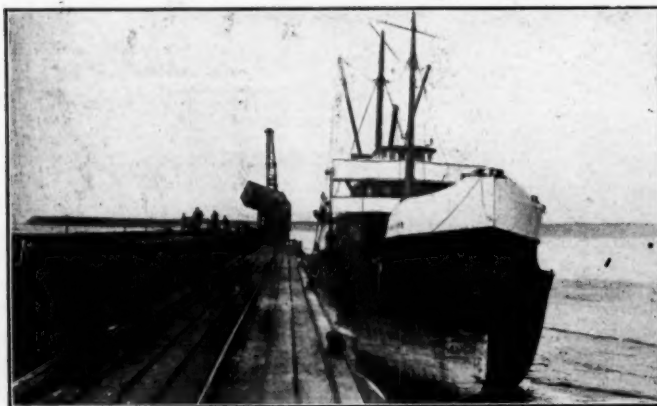
The extension of the present system of federal control for a period of five years, or any extension beyond the limitation now prescribed by law of one year and nine months after the proclamation of peace, is earnestly opposed as prejudicial to the public interest.

The recognized impracticability of continuing government operation of the railroads for twenty-one months after peace under the present law is a conclusive reason why the properties should be relinquished, and in view of the termination of hostilities it should be the policy of the Railroad Administration to restore the integrity of individual properties and prepare for their return to the respective owners.

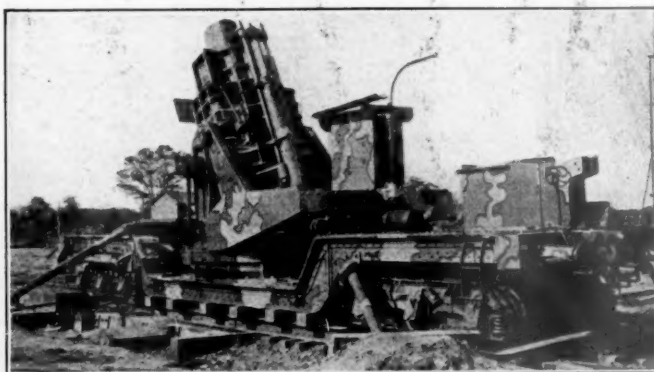
The principle of reasonable, responsible and adequate governmental regulation of transportation facilities is recognized and accepted, but such regulation should provide for the encouragement, protection and development of the railroads.

The Congress should promptly enact such revised legislation as will provide a uniform system of regulation in essential matters, safeguard the public interest, insure adequate revenue to provide for equitable treatment of all questions affecting wages and working conditions of employees and attract sufficient capital to maintain and develop transportation facilities which shall meet the necessities of the commercial, manufacturing and agricultural interests of the country.

Energetic efforts should be exerted to accomplish the early return of the transportation systems of the country to the control and management of their owners; and the enactment of suitable legislation for the protection of the shipping and traveling public, the carriers and their employees.



Unloading Freight from Panama, at Anchorage, Alaska.



Another of the Big Railroad Guns Recently Demonstrated at Aberdeen, Md.

Commission and Court News

State Commissions

The Public Service Commission of New Hampshire, in its annual report, just issued, asks why consolidation and unification of railroads cannot be carried out as well under private ownership as under the government. Rehearsing what are called strictly local questions, the commission asks: "Do farmers wish to have the statute requiring the railroads under certain conditions to maintain farm crossings annulled? Do the property owners wish to surrender their statutory right to call upon the railroads to pay for damages caused by fires from their locomotives? Does the state wish to be deprived of the right to require suitable train service to reasonably accommodate the public?"

Court News

Stipulation for Notice of Loss

Cattle injured by exposure during the first part of their journey were unloaded at a way station, and the shipper, having there disposed of most of the animals, had the remainder transported under the original bill of lading to the destination named. The cattle were not injured in this latter carriage. The Circuit Court of Appeals, Eighth Circuit, holds that the 10-day period after unloading within which notice of loss was required to be given ran from the time of unloading at the way station, and transportation to the original destination did not extend the period. Any other ruling would open the door to discrimination. The requirement could not be waived. A telegram by the shipper to an officer of the railroad company, notifying him that the shipment would suffer injuries if precautions were not taken was not noticed within the provision; and oral notice of loss, given to an agent at the point where the animals were unloaded, although followed by investigation, was not sufficient.—*Olson v. C., B. & Q.*, 250 Fed. 372. Decided March 9, 1918.

Taking of Railroads for War Purposes—

Effect on Garnishment Proceedings

A garnishee summons was served on several garnishee railroad companies on January 29, 1918. Notice was thereafter given to the defendant, the Pennsylvania, as required by statute. Several of the garnishees had, when the summons was served, certain traffic balances in their hands belonging to the Pennsylvania. On motion to quash the proceedings it was urged that by virtue of the provision in the President's proclamation of December 26, 1917, the traffic balances were not garnishable. That provision is to the effect that, except with the prior written consent of the Director General, no attachment by mesne process or on execution shall be levied against the property used by any of the transportation systems taken under federal control in the conduct of their business as common carriers. It was admitted that no written consent of the general director had been obtained granting the levy of the garnishment. The plaintiff claimed however, first, that this particular clause of the proclamation is without warrant of law; second, that traffic balances are not included within the terms of said clause—in other words, that such traffic balances are not "property used by any of said transportation systems in the conduct of their business as common carriers." The federal district court for the District of Minnesota holds that under section 1 of the act of August 29, 1916, c. 418, empowering the President, in time of war, through the Secretary of State, to take possession and assume control of any system or systems of transportation, the clause was fully authorized and valid. What is implied in a statute is as much a part of it as what is expressed, and, when a power is conferred, everything necessary to carry it out and make it effectual will be implied. It is obvious that governmental control of railroads, to be effective, should be exclusive, and not subject to interference by private parties.

The plaintiffs' second contention was not sustained. Certainly cars, engines, coal machinery, would all be wholly within the terms used. Moneys coming in as traffic balances are simply earnings constituting a revolving fund, and form part of a working or liquid capital. Such a fund is just as necessary to the successful operation of a railroad as cars, engines, or coal. The liquid capital may be part of a wage fund today, part of a coal furnishing fund tomorrow, and part of a car rental fund the day after. The court will take judicial notice that no railroad system can be successfully operated without such a fund. The tying up of such a fund would clearly be detrimental to the successful operation of a railroad system, in the same way that the seizure of any other of its property would be. The traffic balances were therefore held within the scope of the President's proclamation, and therefore not subject to garnishment. *Dooley v. Pennsylvania*, 250 Fed. 142. Decided May 10, 1918.

The Federal Employees' Liability Act

The Utah Supreme Court holds that a railroad employee who helps to remove old discarded rails from the track is not engaged in interstate commerce within the act.—*Perez v. Union Pacific (Utah)* 173 Pac. 236. Decided May 23, 1918.

The New York Court of Appeals holds that one of a switch engine crew engaged in making up interstate trains, killed by an engine while going to work some eight minutes before beginning work, was engaged in interstate commerce when killed.—*Knowles v. New York, N. H. & H. R. (N. Y.)*, 119 N. E., 1023. Decided May 28, 1918.

The South Carolina Supreme Court holds that where a conductor, when injured, was engaged in switching a car to the siding to be sent to its home road outside the State, he and the railroad were engaged in interstate commerce.—*Paysom v. Seaboard Air Line (S. Car.)*, 96 S. E. 150. Decided May 3, 1918.

The South Carolina Supreme Court holds that if a car on which a repairer was working when he was killed was to be returned to state service after repairs, the state law fixed the rights and duties of the railroad and the repairer's administrator; if after repairs it was to be used in interstate commerce the federal act fixed these rights and duties.—*Cook v. Southern (S. Car.)*, 96 S. E. 148. Decided April 12, 1918.

The Illinois Supreme Court holds that a servant in switchyards operating a motor to carry switchmen back and forth, injured while hauling switchmen who had been looking after cars of coal moving within the state, but (because they belonged to the company) subject to reconsignment to points without the state, was not engaged in interstate commerce.—*Illinois Central v. Industrial Board (Ill.)*, 119 N. E., 920. Decided June 20, 1918.

The Kentucky Court of Appeals holds that a member of a section gang whose duty it was to repair and maintain the tracks, an instrument of interstate commerce, who left the place where he had been employed on the track under orders of the foreman to meet him at a certain station with a hand car, was employed in interstate commerce within the act.—*Williams v. Chesapeake & Ohio (Ky.)*, 204 S. W., 292. Decided June 21, 1918.

The Maryland Court of Appeals holds that a railroad employee, whose work consisted in taking care of a camp car used by bridge carpenters, and cooking meals for them, injured in a collision while engaged in cooking in the camp car placed on a side track, was engaged in interstate commerce within the act, the railroad being an interstate line, and the car traveling from place to place on the line as repairs were needed.—*P. B. & W. v. Smith (Md.)*, 103 Atl., 945. Decided February 27, 1918.

Where an empty car marked "shop" is being switched from the yards of one carrier, where it had stood for several days, to an interchange track for the purpose of returning it home for repairs, the switching being wholly within the state, the West Virginia Court of Appeals holds that an employee injured while engaged in the operation is not engaged in interstate commerce, though the car was forwarded promptly by its owner to its shop in another state for repair. The mere use of the word "shop" on a car is not equivalent to a designation for haulage in interstate traffic.—*Ewing v. Coal & Coke Ry. Co. (W. Va.)*, 96 S. E., 73. Decided May 7, 1918.

Supply Trade News

Dwight P. Robinson & Co., Inc., constructing and consulting engineers, announce the opening of their offices at 61 Broadway, New York. This organization is prepared to construct, either from their own designs or from the designs of others, hydro-electric developments, steam power plants, transmission systems, industrial plants, housing developments and steel and reinforced concrete structures; to undertake the electrification of steam railways; to act as consulting engineers, and to make engineering and financial reports and appraisals.

H. W. Clarke, who until December 15 was connected with the advertising service department of the McGraw-Hill Company at Chicago, has been appointed manager of advertising for the Chicago Pneumatic Tool Company, Chicago. Prior to his connections with the McGraw-Hill publications he spent eight years with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., part of the time as a member of the sales and publicity departments, and later as western publicity representative, with headquarters at Chicago.

Philadelphia Branch for Walworth

Manufacturing Company

Walworth Manufacturing Company, with general offices at Boston, and works at Boston and Kewanee, Illinois, with branches in New York, Chicago and Seattle, has recently purchased the business of Hunter & Dickson Company, at 241-247 Arch street, Philadelphia, Pa., and after the first of the year will operate it as one of its branches.

Hunter & Dickson Company was founded in 1881. The business began in one room and basement, about 25 by 25 feet, at the present location. Mr. Hunter and Mr. Dickson began their career as boys in the employ of Morris, Tasker & Company in the early sixties. In 1891, Mr. Dickson died, and the business was continued by Mr. Hunter, who later incorporated it in 1900 as Hunter & Dickson Company. In 1913, Mr. Hunter sold out his interest to C. J. Clark, who became president, with Samuel D. Hopkins, vice-president; C. M. Eaton, treasurer, and Robert Hoar, Jr., secretary. Their sales were about \$50,000 the first year, and the business has steadily progressed until of late years it has amounted to several million annually.

Equipment and Supplies

Locomotive Deliveries

Sixty-one locomotives were shipped to railroads under federal control during the week ending December 21 including 48 of the U. S. R. A. standard types, as follows:

Works	Road	Number	Type
American	*N. Y. C.	3	USRA Mikado.
	*Southern	10	USRA Santa Fe.
	C. & N. W.	6	Mikado.
	*Grand Trunk W.	16	USRA Mikado.
	Penn. L. W.	4	USRA 6-w. Switch.
	Seab. Air Line	4	USRA 6-w. Switch.
	Southern	2	USRA 8-w. Switch.
	Penn. L. W.	1	Santa Fe.
	Rutland	1	USRA 8-w. Switch.
	Total	47	
Lima	N. Y. C.	7	USRA Mikado.
	West. Pac.	1	USRA Mikado.
Baldwin	Ill. Cent.	2	Mikado.
	Penn. R. R.	2	Mikado.
	C. B. & Q.	1	Mikado.
	A. T. & S. F.	1	Mikado.
	Total	7	
	Grand total	61	

*Three United States Railroad Administration Mikados constructed for the New York Central and six United States Railroad Administration Mikados constructed for the Grand Trunk West were sent to Buffalo and four United States Railroad Administration Santa Fe locomotives were shipped to Potomac Yards, Va., to be stored as parts of emergency pools.

Financial and Construction

Railway Financial News

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—This company has declared a semi-annual dividend of 2 per cent, making the dividend for the year 4 per cent, or 1 per cent less than in 1917.

WATAUGA & YADKIN RIVER.—The Oil City Trust Company, of Oil City, Pa., has purchased this road at receiver's sale for \$160,000. The road operates 29 miles of line between North Wilkesboro, N. C., and Darby.

PENNSYLVANIA COMPANY.—This company, which controls the Pennsylvania Lines West of Pittsburgh, has declared a semi-annual dividend of 1 per cent, making 6 per cent for the year, the same as in 1917.

MANISTEE & NORTH EASTERN.—The Michigan Trust Company, of Grand Rapids, has been appointed receiver for this road, operating 190 miles of line between Manistee and points in western and central Michigan.

ST. LOUIS-SAN FRANCISCO.—This company has sold to bankers \$10,598,000 prior lien mortgage 6s, series C, dated July 1, 1918, maturing 1928. The bonds are being offered at 96 and interest, to yield about 6.55 per cent.

BOSTON & MAINE.—George W. Anderson, former Interstate Commerce Commissioner, and now a judge of the United States Circuit Court, has been confirmed as one of the trustees of the Boston & Maine stock owned by the New Haven, but under the board's control. He will succeed the late Chief Justice Marcus P. Knowlton and will serve without pay. Judge Anderson, in accepting the position pointed out that usually a federal justice should not be permitted to be active in the administration of a railroad, but that in his case the circumstances are peculiar.

Railway Construction

CISCO & NORTHWESTERN.—This company has been incorporated with a capital stock of \$500,000 to build a railroad between Cisco, Texas, and Graham, 70 miles. The incorporators are: R. O. Lee, G. D. Ward, C. H. Lee, N. W. Maxcill, J. H. Garner, G. C. Lingle, J. B. Elitch, B. S. Huey, T. R. McDaniels, D. E. Jones, F. E. Harell, J. R. Skinner, J. A. Lauderdaill, J. J. Butts, D. K. Scott, W. E. Spencer, William Reagan, E. B. Gude and A. J. Ward, all of Cisco.

PENNSYLVANIA RAILROAD, WESTERN LINES.—This road will build a freight house at Alliance, Ohio, which will be 40 ft. by 250 ft., of brick and timber construction, and to cost about \$35,000.

A contract has been let to G. A. Fuller, Cleveland, Ohio, for the construction at Denison avenue, Columbus, Ohio, of a 32-stall enginehouse, annex and office; car shop, oil house, power house, sand house, fan house, and service building. These buildings will be of reinforced concrete and brick construction, with concrete foundations.

At Ft. Wayne, Ind., the company has under construction and in contemplation a car repair building, store room and office building, machine shop, blacksmith shop, oil and paint storehouse, and firing-up shed.

Trade Publications

DITCHING ON THE PENNSYLVANIA.—The Ball Engine Company, Erie, Pa., has just issued Bulletin S20, entitled "What the Erie Ditcher Is Doing for the Pennsylvania," which shows in an illustrated manner the variety of work which this equipment is doing on different divisions of this road. Figures of cost and operating conditions are included. This booklet also contains a discussion of the advantages of the Erie Ditcher in this class of work.

Railway Officers

Railroad Administration

Central

S. A. Bramlette has been appointed representative of the Division of Labor of the Railroad Administration, effective December 16, with office at Washington, D. C. Mr. Bramlette will be assigned to conduct investigations and to represent the Division of Labor in other specific matters to which he may be assigned, affecting employees of the railroads under federal control.

Federal and General Managers

The Manistique & Lake Superior has been added to the jurisdiction of **E. F. Blomeyer**, general manager of the Ann Arbor, with headquarters at Toledo, O.

J. B. Parrish, general superintendent of the Chesapeake & Ohio, has been appointed general manager of the Chesapeake & Ohio; the Ashland Coal & Iron; the Sandy Valley & Elkhorn, and the Long Fork Railroad, with office at Richmond, Va., vice **J. P. Stevens**, deceased.

Operating

George Geiger has been appointed assistant superintendent of the Virginian Railroad, Norfolk Division, with headquarters at Victoria, Va.

A. C. Reynolds, car accountant of the New York, Ontario & Western, with office at Middletown, N. Y., has been appointed superintendent of car service, and the title of car accountant has been abolished.

G. L. Hurley has been appointed superintendent of the Alabama division of the Seaboard Air Line, with office at Savannah, Ga., vice **J. A. Streyer**, resigned.

Roscoe Hooper has been appointed superintendent of telegraph of all lines under the jurisdiction of **J. A. Edson**, federal manager, with headquarters at Kansas City, Mo., succeeding **R. L. Logan**, deceased.

J. W. Deneen will resume his duties as superintendent of the Cumberland division of the Baltimore & Ohio, Eastern Lines, vice acting superintendent **C. B. Gorsuch**, who will resume his position of relief superintendent.

The jurisdiction of **M. F. Dunn**, general safety agent of the Maine Central and the Portland Terminal, has been extended over the lines of the Bangor & Aroostook, and the Grand Trunk Lines in New England, with office at Portland, Me.

C. F. Holbrook, trainmaster on the Chicago, Milwaukee & St. Paul, at Portage, Wis., has been transferred to the Twin Cities Terminals division, with headquarters at Minneapolis, Minn., succeeding **J. E. Hills**, who has been promoted to assistant superintendent of the Chicago Terminals division, with office at Chicago, to succeed **A. J. Hasenbalg**, who has been transferred to Portage, Wis., as trainmaster on the LaCrosse division.

E. P. Goodwin, general inspector of transportation of the Chesapeake & Ohio, has been appointed assistant to the general manager of the Chesapeake & Ohio; the Ashland Coal & Iron; the Sandy Valley & Elkhorn, and the Long Fork Railroad, with office at Richmond, Va., and the office of general inspector of transportation has been discontinued; **E. L. Bock**, assistant general superintendent of the Chesapeake & Ohio, has been appointed general superintendent of the Western general division, with office at Huntington, W. Va., and **F. L. Poindexter**, fuel agent, has been appointed

assistant to the general superintendent of the Western general division and will continue in charge of fuel matters, with office at Huntington, W. Va. The position of fuel agent has been discontinued.

John D. Beltz, whose appointment as acting superintendent of the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., has already been announced in these columns, was born on December 19, 1879, at Limaville, Ohio. He was educated in the schools at Alliance, Ohio, and later attended Curry College, Pittsburgh. In March, 1894, he began railway work with the Baltimore & Ohio, in the boiler shop. About 1896, Mr. Beltz entered the service of the Pennsylvania Railroad at Homestead as ticket agent and clerk. In 1898 he returned to the Baltimore & Ohio as a fireman, and from that position was appointed engineman. In 1912 he was appointed assistant road fireman of engines, and in 1913 was appointed assistant trainmaster. The following year he was promoted to trainmaster, and in 1917 was appointed assistant superintendent, which position he held until his recent appointment as acting superintendent as above noted.

Financial, Legal and Accounting

P. J. Hunt has been appointed freight claim agent of the Los Angeles & Salt Lake, with headquarters at Los Angeles, Cal.

Charles T. Vose has been appointed supervisor of fire protection of the Maine Central, the Portland Terminal, the Bangor & Aroostook, and the Grand Trunk Lines in New England, with office at Portland, Me.

Traffic

Charles A. Lahey, formerly assistant general freight agent of the Chicago, Milwaukee & St. Paul, and more recently assistant manager of inland traffic for the United States Food Administration, located at Washington and New York City, has returned to the St. Paul to become general freight agent of the lines east of the Missouri river, effective January 1. Mr. Lahey was called to Washington early last spring to assist the Food Administration in the handling of transportation problems, and during the last four months, while in New York, has been intimately associated with the handling of export grain and grain products. Starting from a clerical position with the St. Paul ten years ago, he has held various positions in the traffic department, and for the four years preceding his service with the Food Administration was in active charge of rate litigation before the Interstate Commerce Commission and state railroad commissions.

Engineering and Rolling Stock

Walter B. Harris, supervisor of track of the Okolona district of the Mobile & Ohio, has been promoted to roadmaster of the St. Louis division, with office at Murphysboro, Ill.

W. L. Robinson, supervisor of fuel consumption of the Baltimore & Ohio, Western Lines, Dayton & Union, and the Dayton Union Railroad, has been appointed superintendent of fuel and locomotive performance, and his former position has been abolished.

The jurisdiction of **A. E. Owen**, chief engineer of the Central of New Jersey and the New York & Long Branch, has been extended over the Philadelphia & Reading Railroad, the Atlantic City Railroad, and the Port Reading Railroad, vice **S. T. Wagner**, resigned.

Clark Dillenbeck, engineer of bridges and buildings of the Baltimore & Ohio, with office at Philadelphia, Pa., has been appointed assistant chief engineer of the Philadelphia & Reading, the Central of New Jersey, the New York & Long Branch, the Atlantic City Railroad, and the Port Reading Railroad. **P. S. Baker** has been appointed engineer of bridges and buildings of the Philadelphia & Reading, the Atlantic

City Railroad, and the Port Reading Railroad, vice Clark Dillenebeck.

Purchasing

C. H. Rothgery has been appointed storekeeper of the Baltimore & Ohio, Western Lines, with headquarters at Lorain, Ohio, vice **W. H. Dean**, transferred.

R. C. Harris, supervising engineer for the Pennsylvania Railroad, Western Lines, at Columbus, Ohio, has been appointed general storekeeper, with headquarters at Pittsburgh, Pa. **C. W. Kinnear**, assistant engineer of motive power at Toledo, Ohio, has been appointed assistant general storekeeper, with office at Pittsburgh.

Corporate

Executive, Financial, Legal and Accounting

Arthur H. Van Brunt, advisory counsel of the Pittsburgh & West Virginia and the West Side Belt, has been appointed general counsel of those companies, with office in New York, effective January 1, and the office of advisory counsel has been abolished.

The following appointments have been made on the Canadian National Railways (the new title adopted to include the Canadian Northern and the Canadian Government Railways): **Gerard Ruel**, counsel; **A. J. Hills**, assistant to the president; **T. W. Ralph**, assistant auditor of disbursements; **H. G. Foreman**, chief accountant; **E. A. Kendree**, assistant auditor of freight receipts; **F. J. Gascoigne**, assistant auditor of passenger receipts; **W. L. Brown**, assistant auditor of agencies, and **H. G. Parker**, auditor of freight overcharges. **J. D. Morton**, assistant comptroller of the Canadian Northern at Toronto, Ont., has been appointed general auditor of that road and the Canadian Government Railways; **C. E. Friend**, general auditor of the Canadian Northern at Winnipeg, Man., has been appointed comptroller of both roads; **R. S. Gosset**, auditor of disbursements of the Canadian Northern at Toronto, Ont., has been appointed to the same position also on the Canadian Government Railways, and **H. G. Hanna**, auditor of the Canadian Northern, has been appointed auditor of passenger receipts of the same road and the Canadian Government Railways. The jurisdiction of the following Canadian Northern officers has been extended over the Canadian Government Railways: **W. F. Anderson**, auditor of freight receipts, and **A. C. Egan**, auditor of agencies.

Samuel J. Hungerford, whose appointment as assistant vice-president of the Canadian Northern Railway System and the Canadian Government Railways, with headquarters at Toronto, Ont., has already been announced in these columns, was born on July 16, 1872, near Bedford, Que. He was educated in the common and high schools and began railway work in May, 1886, as a machinist apprentice on the South Eastern, and later served with its successor, the Canadian Pacific, at Farnham, Que. He was then machinist at various places in Quebec, Ontario and Vermont. From August, 1897, to February, 1903, he was consecutively charge-man, at Montreal; assistant foreman at Farnham, Que., locomotive foreman at Megantic, general foreman at McAdam Junction, N. B., and locomotive foreman at Cranbrook, B. C., on the Canadian Pacific. In February, 1903, he was appointed master mechanic on the Western division at Cal-



S. J. Hungerford

gary, Alta. The following January he became superintendent of locomotive shops at Winnipeg, Man., and four years later was appointed superintendent of shops at the same place. In March, 1910, he became superintendent of rolling stock of the Canadian Northern and the Duluth, Winnipeg & Pacific, at Winnipeg, Man., and in May, 1915, was transferred in the same capacity to the Canadian Northern at Toronto, Ont. On November 1, 1917, he was appointed general manager, eastern lines, of the Canadian Northern, at Toronto, which position he held at the time of his recent appointment as assistant vice-president, as above noted.

William A. Patton, assistant to the president of the Pennsylvania Railroad Company and president of the New York, Philadelphia & Norfolk, retired on December 31, 1918, from



W. A. Patton

active service, under the provisions of the pension plan, after a continuous service of 53 years and 11 months. Mr. Patton was born at Union Furnace, Pa., on October 21, 1849. He entered the service of the Pennsylvania Railroad in the office of the general superintendent, at Altoona, in January, 1865. In December, 1871, he was transferred to Philadelphia, and in August of the following year was appointed chief clerk in the office of **A. J. Cassatt**, then general manager. Mr. Cassatt, in 1882, temporarily with-

drew from the railroad service and Mr. Patton went into the office of the president, and on February 10, 1897, he was appointed assistant to President **Frank Thomson**. Mr. Patton has retained the same position, in association with the three succeeding presidents, Cassatt, McRea and Rea. In the promotion and development of the New York, Philadelphia & Norfolk, now an important and prosperous link in the Pennsylvania System, Mr. Patton had a prominent part. On May 24, 1884, he was made vice-president of that road, and in June, 1899, became president. He remained not only president, but also the actual operating executive until the road was, for operating purposes, incorporated with the southern grand division of the Pennsylvania Railroad in 1917. He has been prominently identified with the agricultural and commercial development of the Maryland and Virginia peninsula and was also active in the promotion, construction and operation of the Norfolk & Portsmouth Belt Line Railroad. Mr. Patton has long been prominent in the affairs of the Young Men's Christian Association, and has been general chairman of the Pennsylvania Railroad Department, at Philadelphia, since August, 1899. He is also a member of the International Committee of Young Men's Christian Associations of North America. He is a director in 45 corporations of the Pennsylvania System.

Operating

W. H. Bunney, general superintendent of the Montana, Wyoming & Southern, has been promoted to general manager, succeeding **M. W. Maguire**, resigned, and the office of general superintendent has been abolished.

Obituary

C. H. Ewings, who resigned in July, 1917, as superintendent of freight transportation of the New York Central, died at his home in Tarrytown, N. Y., on December 27.

John J. Hackett, superintendent of terminals of the Cleveland, Cincinnati, Chicago & St. Louis, at Cincinnati, Ohio, died at his home in that city on December 11, aged 46 years.